

CONTAINER WITH CONCERTINA SIDE WALLS AND BASE.

FIELD OF THE INVENTION

The present invention relates to a container which may for example be
5 used for the containment and convenient dispensing (preferably without utensils)
therefrom of foods such as pet food, sauces, yoghurt, custard or the like or other
liquid or semi fluid materials, e.g. oil or grease, glue, resins.

BACKGROUND

10 Consumer packaging is designed to take into consideration functionality
and appearance. By way of example most single serve yogurt containers are
made from a thermoformed plastic. A sheet of thermoplastic is drawn by a
thermoforming machine into a container shape. This generally consists of either
a round or square side wall configuration to define a containment region with an
15 upper opening surrounded by a perimeter flange. The flange provides a place for
a foil seal to engage with the thermoformed plastic to create an openable closure
to the containment region. Some of such containers provide their opposed side
wall(s) substantially parallel to each other although a slight taper may be
provided to allow for the thermoformed product to be extracted from the
20 thermoforming machine. However where the side walls of such a container are
parallel, an empty container (for example to be shipped from its place of
manufacture to its place of packaging), will not be able to nest with like
containers to reduce the total space required for the transport of such containers
in their empty state.

25 One serve yogurt containers may also need to be stacked, one on top of
each other, after they have been filled and sealed. There is a limit to the height
that a stack of such containers can reach in light of the strength of the side walls
of each of the containers. The containers will need to have sufficient wall
thickness to allow for a stack of a suitable or desired height to be achieved
30 without problems with buckling of the side walls and a collapsing of such

containers under the weight of the stack above. Increasing the wall thickness will increase the material costs of each container manufactured. It would be desirable for such a wall thickness to be able to be reduced so as to reduce the cost of goods manufactured yet still provide a container that is of a comparable strength to a container with plain side walls.

Consumption of the food contained within a one serve sized container is often achieved by the use of a spoon. The spoon may transfer the food content directly to the mouth of a consumer. A spoon is a further element that needs to be provided to allow for the contents of such a container to be consumed. Yogurt and custard or other food consumer products such as those having a jelly like consistency are not to any significant extent able to be poured or dispensed quickly from a container due to their high viscosity and/or gelatinous nature. It is therefore necessary to use a spoon to transfer some if not a substantial part of the contents from a container. There also seems to be a trend with consumer packaging products for food containers to allow the food contents to be dispensed without the need for any further implements or utensils. Whilst some non viscous fluids or non gelatinous fluids product contained within a container can be poured from such a container, yogurt or other similar food products can have poor pour characteristics. Such fluids may be Newtonian or non Newtonian fluids that may not necessarily, purely by its viscosity characteristics, have such poor pour characteristics. It is for this reason that normally a spoon is used to dispense the contents of the product from a container. The capability of a package to self dispense a significant part of the contents is being addressed by consumer packaging designers and manufacturers.

Recycling of containers containing consumables is also an important consideration in packaging design. The plain rectangular form of yogurt containers, do not conveniently lend themselves to being compacted. To facilitate efficiencies in recycling, compacting of consumable packaging is a distinct advantage.

It is therefore an object of the present invention to provide a container which will address any one or more of the abovementioned desiderata or the abovementioned disadvantages and/or which will at least provide the public with a useful choice.

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BRIEF DESCRIPTION OF THE INVENTION

In a first aspect the present invention consists in a container including at least one side wall region and a basal wall region surrounding a containment region having an upper opening surrounded by a flange at the ends of the side wall(s) distal from said basal wall region, said side wall(s) include a region of concertina whereby, upon the squeezing of the side wall(s), said basal wall region of the container is compacted more, relative to the extent of the upper opening.

Preferably said side wall(s) are concertinaed in diametrically opposed regions of said side wall(s).

Preferably the region of concertina of said side wall(s) extend between the basal wall region and said flange.

Preferably said region of concertina extend from said basal wall region upwards towards said flange.

Preferably said basal wall region includes a region of concertina.

Preferably the region of concertina of said basal wall, extend in a direction parallel to a plane parallel to which the side wall(s) concertina features extend.

Preferably said container is of a quadrilateral plan shape and includes four side walls extending between said flange and said basal region.

Preferably said four side walls include a first pair of opposed side walls by which the region of concertina of said side walls are defined.

Preferably said region of concertina of said side wall(s) include at least one trough formed in said side wall(s) and that extends between said flange and said basal wall region.

Preferably said region of concertina of said side wall(s) include at least two troughs and a ridge intermediate of two troughs, formed in said side wall(s) and that extends between said flange and said basal wall region.

5 Preferably said region of concertina of said side wall(s) include a series of ridges and troughs extending between said flange and said basal wall region.

Preferably (each) said trough extends from said basal wall region towards said flange but is/are terminated by a web that transitions the side wall between said trough and said flange.

10 Preferably each said web is a planar triangular web with one of its base sides parallel to said flange and one of its apex in the trough.

Preferably each said web is a planar triangular web with one of its base sides parallel to and contiguous said flange and one of its apex in the trough.

Preferably said trough is one defined by said side wall(s) to extend towards said containment region.

15 Preferably a partition wall is included in the containment region to define two partition wall separated compartments said partition wall extending perpendicular to the direction of squeezing.

Preferably said flange includes a zone of weakness to allow for a fracturing of the flange.

20 Preferably said flange includes a zone of weakness to allow for a fracturing of the flange and wherein said zone of weakness is located intermediate the non-concertina opposed side walls.

25 Preferably said opposed side walls that include said concertina, at a given height above the basal wall region, vary in distance from each other by virtue of the concertina.

Preferably the variation of distance is symmetrical about a vertical mid-plane intermediate of said opposed side walls that include said concertina.

Preferably said container is a food container.

30 Preferably said concertina of said side walls meet at said basal wall region.

Preferably said side walls are curved towards each other from said opening and meet at said basal wall region.

Preferably said other pair of side walls are planar sidewalls.

Preferably said container is an open top container.

5 Preferably said opening is the same or larger in size than said basal wall region.

Preferably said flange extends in a plane parallel to the direction of squeezing.

10 Preferably said flange projects outwardly from said opening and beyond the side wall(s)

In a further aspect the present invention consists in a container as herein described and as shown in the accompanying representations.

In a further aspect the present invention consists in a container as shown in the accompanying representations.

15 In a further aspect the present invention consists in a collapsible container comprising;

20 a containment region defined by two opposed side walls extending between a flange surrounding opening and a base region and between two other opposed side walls that extends between said two opposed side walls and between said base region and said flange, said two side walls being of a shape to facilitate their concertinaing in a direction bringing the two other opposed side walls together at least at the base region.

Preferably said flange is a planar flange extending about said opening.

25 Preferably said two side walls, at any given plane parallel to said flange, are not constant in distance from each other save for at a region at or proximate said flange.

Preferably said two side walls, at any given plane parallel to said flange, are not constant in distance from each other save for at a region at or proximate said flange, the distance being proximate most at at least one point of each

opposed side wall, said at least one point being intermediate of said other two opposed side walls.

Preferably said at least one point is midway between said two opposed side walls.

5 Preferably said distance proximate most is defined at at least two points of each opposed side wall.

Preferably said base region is defined by a quadrilateral shaped base wall.

In a further aspect the present invention consists in an open top container defining an opening surrounded by a flange at the top of its wall(s) and including
10 concertinaing features in at least some of its wall(s), the indent of said concertinaing feature(s) transitioning to the flange with a region adapted to encourage compaction of the basal region of said container relative to compaction of the flange.

In a further aspect the present invention consists in a reservoir including a
15 mouth and at least one concertina feature functionally non intrusive of the perimeter of the mouth whereby, by squeezing, the volume of the reservoir can be reduced without any corresponding concertinaing of the mouth of the perimeter.

Preferably a rim surrounding said mouth perimeter for foil sealing said
20 mouth perimeter.

Preferably the mouth perimeter is rendered less planar in its disposition upon the squeezing.

Preferably that is freestanding and has an open top as said mouth.

In a further aspect the present invention consists in a container including
25 at least one side wall and a basal wall surrounding a containment region that includes an upper opening at the top of the side wall(s), said side wall(s) including concertina side wall features save for at or towards the top of said side wall(s), whereby upon the squeezing of the side walls, at least said basal wall of the container is compacted more relative to the extent of the upper opening.

In a further aspect the present invention consists in a collapsible container comprising;

5 a containment region defined by at least two opposed side walls extending between a flange surrounding opening and a base region and between at least one other wall that extends between a opposed side walls and from said flange and that defines a base, said wall being of a shape to facilitate its concertinaing in a direction bringing the two opposed side walls together at least at the base region.

In a further aspect the present invention consists in a dispensing container comprising or including

10 a mouthed reservoir containing or to contain material able to be expressed, wherein the reservoir has at least one concertina feature functionally non intrusive of the mouth perimeter whereby, by squeezing, the volume of the reservoir can be reduced without any corresponding concertinaing of the mouth of the perimeter thereby to at least in part express any content material via the
15 mouth.

In a further aspect the present invention consists in a four sided container comprising

a first pair of opposed side wall,
a second pair of opposed side wall extending between said first pair of
20 opposed side walls,

a base wall extending between said first pair of opposed side walls and said second pair of opposed side walls,

said first pair of opposed side walls and said second pair of opposed side wall and said base wall defining a containment region to contain material and
25 having an open or openable top mouth opening via which said material can be dispensed from said containment region,

wherein the length (measured in a direction parallel to the base wall) of said first pair of opposed side walls is greater than the distance between the second pair of opposed side walls by virtue of at least one elongate trough
30 formed in each said first pair of opposed side walls and extending into or towards

said containment region and having an elongate direction extending in a direction between said mouth and base to provide a predisposition to a collapsing of said first pair of opposed side walls under the action of a squeezing force applied to said second pair of side walls

- 5 and wherein said opening includes a perimeter of a configuration resistant to compression in the squeezing direction to prevent the same extent of collapsing of said mouth as at least the lower regions of said first pair of side walls to thereby dispense material via an open said mouth.

 Preferably said opening is of a quadrilateral perimeter shape.

- 10 Preferably said opening is surrounded by a flange that extends outwardly from said containment region.

 Preferably said flange is a planar flange that is perpendicular to the planes of said first and second opposed side walls.

- Preferably said mouth is of a perimeter shape the same as the base wall
15 plan shape.

 Preferably the distance between the ridges and troughs of on of said side walls is no greater than $1/3$ the distance between opposed sidewalls.

 Preferably the distance between the ridges and troughs of on of said side walls is greater than $1/20$ the distance between opposed sidewalls.

- 20 Preferably the distance between the ridges and troughs of on of said side walls is greater than $1/10$ the distance between opposed sidewalls.

 Preferably there are at least two troughs per concertina feature.

 Preferably there are three troughs per concertina feature.

 Preferably there are four troughs per concertina feature.

- 25 Preferably there are five troughs per concertina feature.

 Preferably there are six troughs per concertina feature.

 Preferably a concertina feature is identical to the opposed concertina feature.

- Preferably wherein said peaks of said concertina features extend to the
30 underside of the flange.

Preferably said partition wall extends from the basal region to said flange.

Preferably said partition wall extends between said basal region and said flange.

Preferably said food is one selected from yogurt, custard, ice cream and
5 jelly.

Preferably said container is a food container to include a liquid beverage.

Preferably said container is a non-food containing container.

This invention may also be said broadly to consist in the parts, elements
and features referred to or indicated in the specification of the application,
10 individually or collectively, and any or all combinations of any two or more of
said parts, elements or features, and where specific integers are mentioned herein
which have known equivalents in the art to which this invention relates, such
known equivalents are deemed to be incorporated herein as if individually set
forth.

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BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of one example of a preferred form of a container,

Figure 2 is a plan view of Figure 1 looking down through the mouth
20 opening of the container of Figure 1,

Figure 3 is a side view of the container of Figure 1,

Figure 4 is a bottom view of the container of Figure 1,

Figure 5 is a side view of another example of a container,

Figure 6 is a bottom view of yet another container,

25 Figure 7 is a plan view of yet an alternative configuration of a container,

Figure 8 is a perspective view of the container of Figure 1 with foil lidding
engaged to the perimeter flange,

Figure 9 is a perspective view of Figure 8 but where the foil lidding has in
part been peeled away from the perimeter flange,

Figure 10 shows an alternative arrangement of lidding where the lidding may be applied to the flange in a more permanent and non-peelable manner but where an outlet spout is incorporated with the lidding,

Figure 11 is a perspective view of the container of Figure 1 having been
5 squeezed to displace food contents from the containment region of the container,

Figure 12 is a plan view of Figure 11, and

Figure 13 is a view in an alternative direction and prior to a full compression of the side walls to squeeze the contents of the container through the mouth opening for subsequent consumption,

10 Figure 14 is a perspective view showing a container in full compression wherein the container also includes a line or zone of weakness through the perimeter flange 9 to assist in further collapsing of the perimeter flange 9,

Figure 15 is a side view of the container of Figure 14 but in a fully compressed and collapsed condition

15 Figure 16 is a perspective view of two containers stacked on top of each other showing a stacking lip or ridge incorporated in the containers to ensure that the perimeter flanges in a stacked condition do not contact each other which may be desirable where the containers are provided in a stacked form to allow for a filling and sealing machine to grip a top most or bottom most container of the
20 stack for removal from the stack for subsequent filling and sealing,

Figure 17 is a plan view of an alternative shape of a container wherein there are two cells or compartments,

Figure 18 is a perspective view of an alternative form of the present invention wherein a partition wall (that may be permanently formed with the
25 container or removable therefrom) is provided intermediate of the opposed surfaces 4 and 5 extending between the concertina or bellowed sides to create two compartments within the containment region,

Figure 19 is a side view of a two cell container wherein one side wall recess is provided in each side wall,

30 Figure 20 is a plan or bottom view of a container of Figure 19,

Figure 21 is a perspective view of a container of Figure 19,

Figure 22 is a perspective view of the container of Figure 19 but with the addition of a partition wall which extends from the base upwardly to provide two compartments within the containment region of the container,

5 Figure 23 is a perspective view of a curved profile container wherein the concertina side walls are curved and joined at the base of the container,

Figure 24 is an end view of the container of Figure 23,

Figure 25 is a multi cell configuration of the container of Figure 23,

Figure 26 is a side view of the container of Figure 23 but wherein a flat
10 base has been provided to allow for the container to be stably supported on a flat surface,

Figure 27 is a plan view of an alternative form of a container shown through section AA of Figure 28,

Figure 28 is a side view of the container shown in sectional view of Figure
15 27,

Figure 29 is a view of the container of Figure 27 in a compressed condition,

Figure 30 illustrates a variation to the container of the present invention wherein the concertina side wall relief does not extend to the rim of the opening
20 and/or perimeter flange,

Figure 31 is an example of a container not part of the present invention shown, for the purposes of illustrating the undesired configuration where compacting of the mouth opening can occur,

Figure 32 is a side view of the upper portion of a container as for example
25 shown in Figure 5, and viewed from direction C,

Figure 33 is a side view of a container illustrating features in respect of the container in its compacted form,

Figure 34 illustrates a side view of a container in a compacted form with an example of a lidding system,

Figure 35 is a side view of the container with a spouted opening provided, and

Figure 36 is a plan view of Figure 35.

5 DETAILED DESCRIPTION OF THE INVENTION

With reference to Figure 1 there is shown a moulded container 1. The moulded container 1 is preferably made from a thermoformed or formable material and in its precursor form comes in a sheet of such a material. A deep drawing thermoforming machine may subject the precursor sheet of material to
10 heat and pressure and with the provision of suitable moulding surfaces can form the containers as herein described. It may also be made by injection moulding or vacuum forming or other suitable processes. Whilst in its most preferred form the container has a containment region of a volume between 100 and 250 ml it will be appreciated by a person skilled in the art that the container can be upsized
15 and downsized yet still achieve the same functionality and desired characteristics as will herein be described.

The moulded container 1 consists of a side wall or walls and a base wall or region. In the example shown in Figure 1, the moulded container 1 is substantially a four sided container having a first pair of opposed side walls 4, 5
20 and a second pair of opposed side walls 6, 7. It is at least the second pair of opposed side walls 6, 7 that each incorporate a profile predisposed to forming a concertina profile. The profile may also be considered a bellow like profile. Profiles predisposed to forming a concertina profile will hereinafter be described in more detail but may include a concertina profile. The "V" shaped concertina
25 profile is the most preferred form.

Intermediate and at the bottom of the opposed pair of side walls 4, 5 and 6, 7 is a base 8.

The base is provided below the side walls 4, 5 and 6, 7 and in conjunction with the side walls defines the containment region 2. At the upper end of the side

walls 4, 5 and 6, 7 may be a perimeter flange 9. The perimeter flange need however not be present.

This perimeter flange 9 is preferably provided about the mouth opening 10 of the moulded container 1. The perimeter flange 9 flares outwardly from the containment region 2 and from the side walls 4, 5 and 6, 7 to present a surface 12 with which a lidding 11 can engage. The perimeter flange 9 may present a substantially continuous and planar engagement surface 12 onto which the lidding 11 can engage. The lidding may for example be a foil material and may be affixed by commonly known techniques that may allow for the lidding 11 to be peeled from the perimeter flange 9. Such peeling is in part demonstrated with reference to Figure 9. An alternative form of the lidding 11 is shown in Figure 10. The lidding may be of a kind (or its affixing to the perimeter flange 9 may be of a kind) that creates a permanent bond to the perimeter flange 9. In the example of Figure 10, the mouth opening 10 of the moulded container 1 is in part exposable by a spout and cap arrangement 13. A cap 13 can for example be threadingly engaged to a spout to allow for the opening of the container and re-closing when desired.

In the peelable foil arrangement shown in Figures 8 and 9 the peelable foil may be of a kind that can be used to re-seal the container. Re-sealable closures are known that could be utilised for the present invention.

The opposing pair of side walls 6 and 7 include surface features that are preferably of a concertina like profile. The surface features ensure that the side walls have a predisposition to forming a concertina like profile. The concertina like profile is a profile that will allow for a compression of the other side walls 4 and 5, towards each other.

The V shaped profile is the most preferred form of profile. Alternatively the profile may be arcuate as shown in Figures 27 and 28.

The preferred concertina profile may also be defined as indents provided in an otherwise planar side wall of the opposing side wall 6 and 7.

These indents or concertina features extend vertically and preferably near or from the lower end of the side walls at or adjacent the base 8, to or towards the upper end of the side walls at or towards the mouth 10. With reference to Figure 30 however it can be seen that the indents of the side walls 6, 7 need not extend completely from the base 8 to the mouth opening 10 of the container. In the example shown in Figure 30, the indents extend from the base 8 towards the mouth opening 10 but terminate short of the mouth opening 10. In this condition compression of the side walls 5, 4 towards each other can still occur and is facilitated at regions where the indents are provided in the side walls 6, 7.

The container shown in Figure 1 provides the opposing side walls 6 and 7 with two indents 14 in each sidewall. In an alternative example as for example shown in Figure 5, the opposing side walls 6 and 7 include four indents each.

For the preferred "V" shaped indents, over a given distance between the side walls 4 and 5, and for any given depth of indent an increasing number of indents 14 in the side walls 6 and 7 will result in the angle between the trough of the indent and the peak of the indent (angle A) increasing towards 90 degrees. The closer the angle is to 90 degrees the easier it will be for the container to be squeezed. The action of squeezing will hereinafter be described in more detail.

Whilst there is described a container which is generally of a square or rectangular plan shape, it is envisaged that the present invention can provide a container in a more circular or oval shape yet still incorporate opposed side walls 6 and 7 which incorporate the concertina relief features. Diametrically opposed regions of such a circular container may incorporate concertina features for the purposes of allowing the container to be squeezed in a manner as hereinafter described. Figure 17 shows an example.

With reference to Figure 7 there is shown yet a further variation where the container is substantially of a rectangular plan view. In the example shown in Figure 7 it is the minor side walls 6, 7 that incorporate the concertina features. Alternatively it could be the major side walls of such a rectangular shaped container that could incorporate the concertina relief features.

In the most preferred form the side walls 4 and 5 are of a planar shape. Such side walls preferably do not include any concertina relief features and may for example be of a flat or slightly curved surface.

At or towards the upper end of the indents 14 a transition web 15 may be provided. It transitions the side walls from the indents, (being in plan view, angled to the straight edge of the flange 9) to being straight. In the examples shown where the indents are V shaped, the transition web extends substantially diagonal (when viewed in side view) to the longitudinal direction of the indents 14. With reference to Figure 32 it can be seen that the web 15 (shown in phantom) extends diagonally to the longitudinal direction of the peak 116 and trough 117 of the indent 14 of the side wall.

With reference to the containers of the kind as for example depicted in Figure 5 where the indents are V shaped, the transition web or webs 15 are of a triangular shape. It will be appreciated that (and with reference to Figures 27 and 28, where the indents are of a different cross sectional profile) the transition webs need not be of a triangular shape.

The webs 15 assist in creating a transition between the indents 14 and the perimeter flange 9 or the straight upper edge of side walls 6, 7. The transitioning from a concertina side wall profile (or profile that is predisposed to forming a concertina profile) to a straight upper edge, assists in providing the desired effect in the movement of the features of the container during compacting. It may be the straight and preferably substantially continuous upper edge at region 118 (as shown in Figure 32) of the transition webs 115, the transition webs themselves and/or the perimeter flange 9, that each extend substantially parallel to the direction of compression, that assist in ensuring that the mouth of the container does not compact like the base of the container.

One or more of such aspects assist in ensuring that the mouth does not compact like the base of the container compacts. Instead they encourage the flange 9 to arc about the containment region 2, as for example shown in Figures 11, 12 and 13. With reference to Figure 31, where the container as shown, does

not include any structural member extending continuously in the compression direction PP at the mouth opening, the mouth opening 10 will compact. The perimeter 119 (whether flanged or not) in this example will intrude the mouth opening 10.

5 The web or webs 15 (in the preferred form where they are triangular in shape) are planar in form. Their plane is preferably parallel to the direction in which the compacting force PP is applied. As a result these webs present resistance to this region being compacted. In particular at the upper edges 118 of the webs 15, where the webs may substantially abut each other, a straight edge is
10 formed parallel to direction PP.

 The container of the present invention may or may not be provided with the upper flange 19. Even without the upper flange 19, sufficient resistance to compacting at the mouth, to achieve the desired form of the container in its compacted state, can be achieved by the containers as herein described.

15 When provided, the upper flange 9 does assist in providing additional resistance to compacting at the mouth opening as well as providing a surface for a lid to seal with. Alternatives to the flange 9 may be provided depending on the nature of the closure or lidding that is desired for the container.

 In a preferred form, the webs 15 help create an arc or arcuate like form of
20 the perimeter flange 9 during compacting of the base. As can be seen in Figure 13 the perimeter flange 9 is curved when the base and side walls 6, 7 are compacted. As can be seen with reference to Figure 33, compacting of the containment region by the application of the pressure in direction PP does subject the perimeter flange 9 to a compression force in the same directions. As the
25 material of the present invention has flexibility, there is a natural tendency for the edges 128 to move closer together. As a result of the straight line resistance offered by the perimeter flange 9 and/or the edges 118 and/or webs, the previously straight edges 118 can move closer together but only as a result of the bending of the edge 118 to an arcuate form as shown in Figure 33. Distance X is
30 less in the compacted form than in the uncompact form. This assists in

exposing the upper zone of containment region 2 of the container to allow for a person to achieve more convenient access by their mouth and/or tongue or spoon or scoop for the purposes of removing and consuming the contents.

For edible contents, when the perimeter flange 9 is in such an arcuate form, it is more convenient for a person's mouth or tongue to engage with lower portions of the containment region without the person's nose impinging or hitting the perimeter flange. Part of the perimeter (and where provided, the perimeter flange) has been folded down thereby reducing the possibility of a person's nose from touching the perimeter (and flange) and thereby allowing for a person to gain access to previously deeper parts of the containment region. Furthermore The webs 15 eliminate any significant pockets in the compacted form of the container at and below the perimeter flange 9.

As well as forming of the perimeter into an arcuate form, exposure of the upper regions of the side walls 4 and 5, to what can be seen in Figure 11 as being substantially V shaped from, occurs. This also aids in allowing for convenient access to be obtained to the contents of the container. This shallow V shaped form of the upper portions of the side walls 4 and 5 allows a person to conveniently transfer the contents of the container that is displaced within the shallow V shaped formed side wall regions.

With reference to Figures 14 and 15, a line or zone of weakness 60 may be provided at the perimeter flange 9. The zone or line of weakness 60 is preferably provided substantially midway between the opposing side walls 4 and 5. The zone or line of weakness allows for a fracturing of the perimeter flange 9 to occur at a certain stage during either the compression of the base or during compacting of the base or during additional compression of the perimeter flange by a squeezing in for example the opposing directions FF on the perimeter flange at its regions near the side walls 4 and 5. A fracturing of the perimeter flange 9 at the zone or line of weakness 60 will result in the perimeter flange 9 from significantly reducing its structural rigidity to allow for it to be compressed. Such compression is shown for example with reference to Figure 15 to bring the

regions of the perimeter flange 9 proximate the side walls 4 and 5, closer together. This allows for the container to be manipulated to encourage a condition that is significantly more compressed than in its completely non-compressed and non-compacted state. Such compression has the benefit of
5 reducing the volume of the container thereby adding to the efficiencies in any recycling of the container. A compressed container for example being delivered to a recycling plant, will place significantly lower volume demands on its transportation.

The provision of the concertina opposing side walls 6 and 7 may also
10 enhance the side wall strength of the container 1. As a result of the concertina configuration the side wall strength is enhanced to resist any buckling of the walls under a pressure pressing onto the container in a top to bottom direction. The concertina increases the total effective side wall length as well as being of a shape which provides greater resistance to buckling than a planar side wall. Such
15 increase in strength can allow for a reduction in the side wall thickness to occur. A reduction in thickness can lead to a reduced cost of manufacture.

The concertina features are also provided to assist in a squeezing of the container. In conjunction with the concertina side walls where such are provided for the purposes of a squeezing of the container, the base 8 is preferably also
20 provided with surface relief 20 that can facilitate in the compacting of the base 8 when the container is being squeezed. Such surface relief can be corrugations or concertina like features that have a longitudinal characteristic. Longitudinal directions of the surface relief 20 preferably extends in a direction parallel to the general plane of the first opposed pair of side walls 4, 5. The surface relief 20
25 preferably extends substantially all the way between the second pair of opposed side walls 6, 7. As can be seen in Figure 2 three such surface relief features 20 are provided.

The number of such surface relief features 20 need not (but preferably do) correspond to the number of indents 14 provided to the second pair of opposed
30 side walls 6 and 7. A sufficient number of such surface relief features are

provided to assist in the compacting of the base 8 upon the squeezing of the container.

In the most preferred form when looking at the base from below, the surface relief 20 are recesses extending into the containment region. The relief
5 20 thereby preferably does not project downwardly beyond the otherwise generally planar base 8.

They could be relief extending (when compacted an/or pre-compacting) away from the container.

As mentioned it is desirable to allow for the contents contained within the
10 container to be dispensed without the need for additional utensils or implements. The present invention allows for this to be achieved by the fact that the side walls 6, 7 allow for the bringing together of the side walls 4 and 5. The force applied to the side walls 4 and 5, such as by a thumb and forefinger, will displace the opposing side walls 4 and 5 together. The concertina relief features will each
15 condense towards each other and the indents will decrease in size upon the squeezing of the opposing side walls 4 and 5 together. The base will also compact.

The volume reducing effect of the squeezing of the container will in a first instance displace the contents out through the opening 10 for a person to use their
20 mouth directly, to consume the contents. Any content remaining within the then partially reduced volume of the containment region 10 can then be conveniently reached by for example a tongue or mouth of a person to transfer the remaining food contents from the containment region 10. This allows for convenient access and substantially full consumption of the contents of the container to be achieved
25 by a person.

With the preferred tapered form of the container as shown in the accompanying drawings, the nesting of such a container with like containers can also occur. This will aid in the transport of the yet to be filled containers from its place of manufacture to a place where it may be filled.

Figure 16 is a perspective view of two containers of the present invention stacked on top of each other showing a stacking lip or ridge 61 incorporated in the containers to ensure that the perimeter flanges 9 in a stacked condition do not contact each other. This is a feature that may be desirable where the containers are provided in a stacked form to a customer of an organisation manufacturing the containers to allow for the machines to grip a top most or bottom most container of the stack for removal from the stack for subsequent filling and sealing.

With reference to Figure 17 there is shown a plan view of an alternative form of a container wherein arcuate side walls 4, 5 are provided and the bellowed or concertina side walls include only one recess. This form of the product can be manufactured according to the present invention to perform in a like manner to the form of the product shown in the other figures.

With reference to Figure 18 is a perspective view of an alternative form of the present invention wherein a fixed or removable partition wall is provided intermediate of the opposed surfaces 4 and 5 extending between the bellowed sides to create two compartments within the containment region of the container of the present invention.

With reference to Figure 34 there is shown a side view of a container in its compacted state wherein a lid 11 has popped open from the perimeter flange 9 to expose the mouth opening 10 of the container. In this example the lid 11 has popped or been peeled partially from the perimeter flange 9 yet remains attached at region 130. Where a lid, which is for example more of a substantially rigid material, is provided the tendency for the lid to lift from the flange 9 when the flange 9 is bent to an arcuate form will be encouraged. If the container is moved back to its pre-compacted state, the flange 9 will straighten and the lid will then again be substantially contiguous the flange 9.

With reference to Figure 35 and 36, there is shown a container of the present invention wherein a spout 140 is shown. The spout 140 is a deformation in a side wall 4 or 5 and is preferably lidded as part of the same lid that covers

the general mouth opening 10. A partial peeling of the lid can expose the spout opening and a subsequent compression of the container can allow for part of its contents to be dispensed through the spout 140. The spout is a protrusion from the side wall 4 of the container. For the purposes of mass production a
5 corresponding recess may be provided in the side wall 5 so that an end to end array of containers can be provided the spout of one container sitting within the recess of an adjacent container.

Also with reference to Figure 35, there is shown in the side walls 4, 5 a surface indent that may be provided to encourage the use of the container during
10 compression in the appropriate manner. The indent will encourage a persons fingers to engage at such an indent for the application of the force to compact the container. The indent 150 on one or each of the side walls 4, 5 may alternatively be ribs or other surface relief.

Alternatively the graphics on the side walls 4, 5 may be provided to
15 encourage the appropriate use of the container.

The preferred wall thickness of the container (although such may vary from place to place) is in the range of 0.3mm to 2.2mm - preferably 0.7mm. The materials that may be used for the container may be P.S. or PET or PE. It may also be formed out of a metal, cellulosic material, waxed card etc.

CLAIMS:

1. **A container including**
 - a) at least one side wall and
 - b) a basal wall , said side wall and basal wall surrounding
 - 5 c) a containment region, said containment region including an upper opening at least partially surrounded by a flange disposed at the ends of the side wall(s) distal from said basal wall,
 - d) said side wall(s) including a region of concertina whereby, upon the squeezing of the side wall(s), said basal wall of the container is
 - 10 compacted more, relative to the extent of the upper opening.
2. A container as claimed in claim 1 wherein said side wall(s) are concertinaed in opposed regions of said side wall(s).
3. A container as claimed in claims 1 or 2 wherein the region of concertina of said side wall(s) extend between the basal wall and said flange.
- 15 4. A container as claimed in claims 1, 2 or 3 wherein said region of concertina extends from said basal wall upwards towards said flange.
5. A container as claimed in any one of claims 1 to 4 wherein said basal wall includes a region of concertina.
6. A container as claimed in claim 5 wherein the region of concertina of said
- 20 basal wall, extend in a direction parallel to a plane parallel to which the side wall(s) concertina features extend.
7. A container as claimed in any one of claims 1 to 6 wherein said container is of a quadrilateral plan shape and includes four side walls extending between said flange and said basal wall.
- 25 8. A container as claimed in claim 7 wherein said four side walls include a first pair of opposed side walls by which the region of concertina of said side walls are defined.
9. A container as claimed in any one of claims 1 to 8 wherein said region of concertina of said side wall(s) include at least one trough formed in said side
- 30 wall(s) and that extends between said flange and said basal wall.

10. A container as claimed in any one of claims 1 to 8 wherein said region of concertina of said side wall(s) include at least two troughs and a ridge intermediate of two troughs, formed in said side wall(s) and that extends between said flange and said basal wall.
- 5 11. A container as claimed in any one of claims 1 to 8 wherein said region of concertina of said side wall(s) include a series of ridges and troughs extending between said flange and said basal wall.
12. A container as claimed in any one of claims 9 to 11 wherein (each) said trough extends from said basal wall towards said flange but is/are terminated by a
 - 10 web that transitions the side wall between said trough and said flange.
13. A container as claimed in claim 12 wherein each said web is a planar triangular web with one of its base sides parallel to said flange and one of its apex in the trough.
14. A container as claimed in claim 12 or 13, wherein each said web is a planar
 - 15 triangular web with one of its base sides parallel to and contiguous said flange and one of its apex in the trough.
15. A container as claimed in any one of claims 9 to 14 wherein said trough is one defined by said side wall(s) to extend towards said containment region.
16. A container as claimed in any one of claims 1 to 15 wherein a partition wall
 - 20 is included in the containment region to define two partition wall separated compartments said partition wall extending perpendicular to the direction of squeezing.
17. A container as claimed in any one of claims 1 to 16 wherein said flange includes a zone of weakness to allow for a fracturing of the flange.
- 25 18. A container as claimed in claim 8 wherein said flange includes a zone of weakness to allow for a fracturing of the flange and wherein said zone of weakness is located intermediate the non-concertina opposed side walls.
19. A container as claimed in any one of claims 7 to 18, wherein said opposed side walls that include said concertina, at a given height above the basal wall,
 - 30 vary in distance from each other by virtue of the concertina.

20. A container as claimed in claim 19 wherein the variation of distance is symmetrical about a vertical mid-plane intermediate of said opposed side walls that include said concertina.
21. A container as claimed in any one of claims 1 to 20 wherein said container
5 is a food container.
22. A container as claimed in claim 7 wherein said concertina of said side walls meet at said basal wall.
23. A container as claimed in any one of claims 6 to 22 wherein said side walls are curved towards each other from said opening and meet at said basal wall.
- 10 24. A container as claimed in any one of claims 6 to 19 wherein said other pair of side walls are planar sidewalls.
25. A container as claimed in any one of claims 1 to 24 where said container is an open top container.
26. A container as claimed in claim 6 where said opening is the same or larger
15 in size than said basal wall.
27. A container as claimed in any one of claims 1 to 26 wherein said flange extends in a plane parallel to the direction of squeezing.
28. A container as claimed in anyone of claims 1 to 17 wherein said flange projects outwardly from said opening and beyond the side wall(s).
- 20 29. **A collapsible container** comprising;
- a) a containment region defined at least in part by
 - i) two opposed side walls extending between
 - ii) an opening and a base region, said opening being at least
partially surrounded by a flange for maintaining the
opening in an opened condition, and between
25
 - iii) two other opposed side walls that extends between said two opposed side walls and between said base region and said flange,

- b) said two side walls being of a shape to facilitate their concertinaing in a fashion to bring the two other opposed side walls towards each other at least at the base region.

30. A collapsible container as claimed in claim 29 wherein said flange is a planar flange extending about said opening.

31. A collapsible container as claimed in claim 29 or 30, wherein said two side walls, at any given plane parallel to said flange, are not constant in distance from each other save for at a region at or proximate said flange.

32. A collapsible container as claimed in claim 29 or 30 wherein said two side walls, at any given plane parallel to said flange, are not constant in distance from each other save for at a region at or proximate said flange, the distance between two said side walls being closest at at least one point of each opposed side wall, the point being between said other two opposed side walls.

33. A collapsible container as claimed in claim 32 wherein said at least one point is midway between said other two opposed side walls.

34. A collapsible container as claimed in claims 32, wherein the closest distance between two said side walls is defined at at least two points of each opposed side wall.

35. A collapsible container as claimed in any one of claims 29 to 34 said base region is defined by a quadrilateral shaped base wall.

36. **An open top container** comprising

- a) at least one wall defining
- b) a basal region, and
- c) an opening at least partially surrounded by
- d) a flange at the top of its wall(s) and including
- e) at least one concertinaing feature in at least one collapsible region of the wall(s), an indent of said concertinaing feature(s) transitioning between the basal region and the opening,
- f) the collapsible region being adapted to facilitate compaction of the basal region of said container relative to compaction of the flange.

37. **A reservoir including**

- a) sidewalls, said sidewalls defining
- b) a mouth, said mouth at least partially surrounded by
- c) a flange,

5 said sidewalls including at least one vertically aligned concertina feature functionally non intrusive of the perimeter of the mouth whereby, by squeezing, the volume of the reservoir can be reduced through collapse of the concertina feature without corresponding collapse of the perimeter of the mouth .

10 38. A reservoir as claimed in claim 37 wherein said flange presents a rim surrounding said mouth perimeter for foil sealing said mouth perimeter.

39. A reservoir as claimed in claims 37 or 38 wherein the mouth perimeter is rendered less planar in its disposition upon the squeezing.

15 40. A reservoir as claimed in any one of claims 37 to 39, that is freestanding and has an open top as said mouth.

41. **A container including**

- a) at least one side wall and
- b) a basal wall surrounding
- c) a containment region that includes
- 20 d) an upper opening at the top of the side wall(s), said side wall(s) including
- e) collapsible side wall features save for at or towards the top of said side wall(s), whereby upon the squeezing of the side walls towards each other, the collapsible side wall features are adapted and configured to
- 25 collapse in a manner so that at least said basal wall of the container is compacted more relative to the extent of compaction of the upper opening.

42. **A collapsible container comprising;**

- a) a containment region defined by
- 30 b) at least two opposed side walls extending between

- i) an opening at least partially surrounded by a flange, and
- ii) a base region, and
- iii) further extending between at least one other wall that extends between the opposed side walls and from said flange to define a base, said wall being of a shape to facilitate its collapse in a direction to bring the two opposed side walls towards each other at least towards the base region.

5

43. **A dispensing container comprising or including**

- 10 a) a mouthed reservoir containing or to contain material able to be expressed,
- b) wherein the mouth of the reservoir is at least partially surrounded by a flange, and

the reservoir includes side walls, said side walls including at least one
 15 vertically aligned concertina feature whereby, by squeezing, the volume of the reservoir can be reduced by collapse of said side walls of the container towards each other without corresponding collapse of the mouth of the perimeter thereby to at least in part express any content material via the mouth.

44. **A four sided container comprising**

- 20 a) a first pair of opposed side walls,
- b) a second pair of opposed side wall extending between said first pair of opposed side walls,
- c) a base wall extending between said first pair of opposed side walls and said second pair of opposed side walls,
- 25 d) said first pair of opposed side walls and said second pair of opposed side wall and said base wall defining a containment region to contain material and an open or openable top mouth opening via which said material can be dispensed from said containment region,
- e) wherein the length of each of the first pair of opposed side walls
 30 defines at least one elongate trough which extends into or towards said

containment region and extending longitudinally in a direction between said mouth and base to facilitate the collapsing of said first pair of opposed side walls when the second pair of opposed side walls are operationally compressed towards each other;

- 5 f) and wherein said opening includes an at least partially flanged perimeter of a configuration resistant to compression at least in the operational direction of compression to prevent the same extent of collapsing of said mouth as at least the lower regions of said first pair of side walls to thereby facilitate dispensing of material through said
- 10 mouth.

45. A container as claimed in claim 44 wherein said opening is of a quadrilateral perimeter shape.

46. A container as claimed in claims 44 or 45, wherein said opening is surrounded by a flange that extends outwardly from said containment region.

- 15 47. A container as claimed in any one of claims 44 to 46 wherein the flange is a planar flange that is perpendicular to the planes of said first and second opposed side walls.

48. A container as claimed in any one of claims 44 to 47 wherein said mouth is of a perimeter shape the same as the base wall plan shape.

20 **49. A container, suitable for containing contents, comprising**

- a) at least one side wall surrounding an opening; and
 - b) a containment region defined by the side wall(s);
 - c) wherein said opening is at least partially surrounded by a flange;
 - d) and wherein said side wall(s) includes vertically aligned collapsible
- 25 formations for facilitating the collapse of opposed regions of the side wall(s) towards each other when the opposed regions of the side wall(s) are compressed to reduce the volume of the containment region, thereby to facilitate the dispensing of said contents from the container.

50. A container as claimed in claim 49, wherein the sidewalls and the shape of the opening, and the flange, deform upon the compression of the container.

51. A container as claimed in claim 49, wherein the sidewalls, from the flange and to or toward the base, and the shape of the opening, and the flange, deform
5 upon the compression of the container.

52. **A set of containers**, wherein

a) **each container comprises**

- i) at least one side wall surrounding an opening; and
- ii) a containment region defined by the side wall(s);
- 10 iii) wherein said opening is at least partially surrounded by a flange;
- iv) and wherein said side wall(s) includes vertically aligned collapsible formations for facilitating the collapse of opposed regions of the side wall(s) towards each other
15 when the opposed regions of the side wall(s) are compressed to reduce the volume of the containment region, thereby to facilitate the dispensing of said contents from the container; and

b) said containers are integrally formed with each other.

20 53. A set of containers as claimed in claim 52, wherein the set of containers is integrally formed in an injection moulding, vacuum forming, rotary moulding or blow moulding process.

54. A set of containers as claimed in claim 52 or 53, wherein the set of containers is formed from a single sheet of material in a deep drawing
25 thermoforming machine.

55. **A container including**

- a) at least one side wall and
- b) a basal wall, said side wall and basal wall surrounding
- c) a containment region, said containment region having an upper
30 opening surrounded by a flange,

- d) said side wall(s) including a region of collapse whereby, upon the squeezing of the side wall(s), said basal wall of the container is compacted more, relative to the extent of the upper opening;
- e) and wherein the side walls extend directly downwardly from the upper opening of the container.

5

56. A container as claimed in claim 55, wherein the upper opening defines a plane, and the side walls extend directly downwardly from the plane of the upper opening of the container at an angle tending towards 90 degrees.

57. A container as claimed in claim 55 or 56, wherein the sidewalls and the opening including the flange deform upon the squeezing of the container.

10

58. A container as claimed in claim 55, 56 or 57, wherein the sidewalls, from the flange and to or toward the base, and the opening including the flange deform upon the squeezing of the container

59. A container as claimed herein and as shown in the accompanying representations.

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60. A container as shown in the accompanying representations.