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(54) **Title:** REUSABLE CUP WITH REMOVABLE SEALING LID

(57) **Abstract:** A container assembly includes a cup having an open end surrounded by a peripheral lip, and a lid that is configured to be removably seated on the open end of the cup so as to engage the lip. The lip is elongated in the longitudinal dimension from a first or upper periphery at the open end of the cup to a second or lower periphery longitudinally spaced from the first or upper periphery, whereby the lip tapers from a first outside diameter at the first or upper periphery to a second outside diameter greater than the first outside diameter at the second or lower periphery, thereby defining a radially outward tapered lip surface. The lid has a peripheral rim with an inner surface that is configured to seat against the tapered lip surface so as to provide a seal between the rim and the lip.



## REUSABLE CUP WITH REMOVABLE SEALING LID

### BACKGROUND

[0001] This disclosure relates generally to the field of containers for holding potable liquids, and more particularly to drinking vessels. Still more specifically, this disclosure relates to a container, such as a cup, with a removable lid that provides a sealing closure for the container.

[0002] Drinking vessels or cups made of paperboard or plastic are ubiquitous in homes, institutions, and commercial establishments. The typical paperboard or plastic cup is made for a single use, and is therefore disposable. Many of these cups are provided with a removable lid. When the lid is installed on the cup, the inside of the lid seats against a peripheral rim or lip around the open end of the cup to provide a seal that may be partially liquid-tight. The lip or rim of the cup is typically substantially circular in cross-section. This shape is only satisfactory if a substantially liquid-tight seal is not needed. Moreover, whatever sealing effect that may be achieved is substantially degraded due to distortion of the rim or lip with repeated removal and re-installation of the lid. Thus, the conventional lip or rim is less than satisfactory for a reusable cup that is used with a removable lid.

[0003] It would therefore be advantageous to provide a reusable container or cup with a removable lid that provides a good sealing closure when the lid is installed on the container or cup, and that maintains a good sealing function after repeated cycles of installing and removing the lid.

### SUMMARY

[0004] Broadly, in one aspect, this disclosure relates to a container assembly comprising a cup having an open end and a peripheral lip around the open end, and a lid or cover that is configured to be removably seated on the open end of the cup so as to engage the lip. The lip is elongated in the longitudinal dimension from a first or upper periphery at the open end of the cup to a second or lower periphery longitudinally spaced from the first or upper periphery, whereby the lip tapers from a first outside diameter at the first or upper periphery to a second outside diameter greater than the first outside diameter at the second or lower periphery, thereby defining a radially outward tapered lip surface. The lid or cover has a peripheral rim

with an inner surface that is configured to seat against the tapered lip surface so as to provide a seal between the rim and the lip. In one embodiment, the second or lower periphery of the lip may advantageously define a substantially annular shoulder around an exterior surface of the cup, and the inner surface of the peripheral rim of the lid or cover advantageously includes an annular, inwardly-extending bead configured to seat against the shoulder when the lid or cover is installed to provide an improved grip between the lid or cover and the cup.

#### BRIEF DESCRIPTION OF THE DRAWINGS

- [0005] Figure 1 is a perspective view of a container assembly in accordance with an embodiment of this disclosure, the container assembly comprising a cup and a removable lid;
- [0006] Figure 2 is a top plan view of the container assembly of Figure 1;
- [0007] Figure 3 is a cross-sectional view taken along line 3 – 3 of Figure 2;
- [0008] Figure 4 is an enlarged cross-sectional view of the upper portion of the cup shown in Figure 1;
- [0009] Figure 5 is an enlarged cross-sectional view of the portion of the container assembly shown within the dashed circle 5 – 5 of Figure 3; and
- [0010] Figure 6 is a view similar to that of Figure 5, but showing the lid in the process of being installed on or removed from the cup.

#### DETAILED DESCRIPTION

[0011] Referring first to Figures 1-3, a container assembly 10 in accordance with an embodiment of this disclosure is shown. The container assembly comprises a container or cup 12 having an open end 14 (Fig. 3), and a lid or cover 16 that is configured to removably fit over the open end 14 of the cup 12. The lid 16 has an upper or top portion (Fig. 2) that is shown in an exemplary configuration; other suitable configurations may be employed within the scope of this disclosure. In the exemplary configuration shown, the top portion of the lid 16 may include a central area 18 circumferentially surrounded by a raised annular rib or boss 20. A sipping orifice 22 may be provided in the annular rib or boss 20 in some embodiments; such embodiments would advantageously include a vent hole 24 in the central area 18 to permit liquid to flow out of the sipping orifice 22. Also, in some embodiments, the central area 18 may be sloped, as shown, for example, in Fig. 3.

[0012] The cup 12 may be made of paperboard, or a plastic foam, such as, for example, polystyrene foam, or an extruded plastic, such as, for example polyethylene terephthalate (PETE). Another suitable material is an extruded mixture of pulverized paper powder and resin, as described in European Patent Application No. EP 2308599 (the disclosure of which is incorporated herein by reference) and sold under the trademark PERMAPULP by Takeya USA, Inc. The lid 16 may be formed from a sheet of a suitable plastic, such as, for example, PETE.

[0013] Figure 4 shows the open end 14 of the cup 12 in detail. A peripheral lip 26 is provided around the open end 14. The lip 26 is elongated in the longitudinal dimension from a first or upper periphery 28 at the open end 14 of the cup to a second or lower periphery 30 longitudinally spaced from the first or upper periphery 28, whereby the lip 26 tapers from a first outside diameter D1 at the first or upper periphery 28 to a second outside diameter D2 greater than the first outside diameter D1 at the second or lower periphery 30, thereby defining a radially outward tapered lip surface 32.

[0014] Referring now to Figures 3, 5, and 6, the lid 16 has a peripheral rim 34 with an inner surface 35 that is configured to frictionally engage the tapered lip surface 32 so as to provide a seal between the rim 34 and the lip 26. Thus, in one exemplary embodiment, as illustrated in Figures 5 and 6, the inner rim surface 35 has a radially outward taper that is complementary to, and thus conforms to, the tapered lip surface 32.

[0015] In one exemplary embodiment, the second or lower periphery 30 of the lip 26 may advantageously define a substantially annular shoulder 36 between an exterior surface 38 of the cup 12 and the second or lower periphery 30 of the lip 26. In such an embodiment, the inner surface of the peripheral rim 34 of the lid 16 advantageously would advantageously include an annular, inwardly-extending bead 40, configured to seat against the shoulder 36 when the lid 16 is installed on the open end 14 of the cup 12, as shown in Fig. 5, to provide an improved grip between the lid 16 and the cup 12. In an exemplary embodiment, the peripheral rim 34 and the bead 40 of the lid 16 are configured so that, as the lid 16 is seated on the cup 12, the bead 40 engages the tapered lip surface 32 to resiliently flex the rim 34 radially outwardly by a small amount, indicated by the arrow A in Fig. 6, so that as the bead 40 passes the second or lower periphery 30 of the lip 26, it resiliently “snaps” into engagement with the shoulder, thereby securing the lid 16 onto the cup 12.

[0016] From the foregoing, it will be appreciated that the configuration of the lip 26, as described above and as shown in the drawings, allows the lid 16 to be installed on the cup 12, and to be removed therefrom, without significantly distorting the lip 26. Thus, repeated removal and reinstallation of the lid 16 will not appreciably degrade the lip-to-lid seal. In the exemplary embodiment shown in the drawings and described above, in which a bead 40 is provided on the inner surface of the lid rim 34, the abrading contact between the rim 34 and the tapered lip surface 32, when the lid 16 is being installed on or removed from the cup 12, is substantially limited to contact between the bead 40 and the lip surface 32, thereby further reducing degradation and distortion of the lip surface 32 due to abrasion. The result is a much more durable sealing structure between the cup 12 and the lid 16, thereby allowing the container assembly 10 according to the present disclosure to be reused many times while still maintaining a good sealing effect. Moreover, the engagement between the bead 40 and the shoulder 36 provides a more secure fit of the lid 16 on the cup 12, as compared, for example, with conventional cup-and-lid assemblies.

[0017] Although a preferred embodiment has been described above and shown in the drawings, it will be appreciated that this specific embodiment is exemplary only, and that equivalent structures that may suggest themselves to those skilled in the pertinent arts should be considered within the scope of this disclosure. For example, and without limitation, it will be readily appreciated that other suitable configurations for the lid 16 may be employed in the disclosed container assembly, and that the illustrations of the lip 26 are not to be understood as defining any specific tapered contour.

## WHAT IS CLAIMED IS:

1. A container assembly comprising:
  - a cup with an open end and a peripheral lip around the open end; and
  - a lid configured to be removably seated on the open end of the cup so as to engage the lip;
  - wherein the lip is elongated in the longitudinal dimension from a first periphery at the open end of the cup to a second periphery longitudinally spaced from the first periphery, whereby the lip tapers from a first outside diameter at the first periphery to a second outside diameter greater than the first outside diameter at the second periphery, thereby defining a radially outward tapered lip surface.
2. The container assembly of claim 1, wherein the lid has a peripheral rim with an inner surface configured to engage the tapered lip surface so as to provide a seal between the rim and the lip.
3. The container assembly of claim 2, wherein the second periphery of the lip defines a substantially annular shoulder around an exterior surface of the cup, and wherein the inner surface of the peripheral rim of the lid includes an annular, inwardly-extending bead configured to seat against the shoulder.
4. The container assembly of claim 3, wherein, during installation of the lid on the cup and removal of the lid from the cup, abrading contact of the inner surface of the rim with the tapered lip surface is substantially limited to the bead.
5. The container assembly of claim 2, wherein the inner surface of the peripheral rim has a tapered configuration that conforms to the tapered lip surface.

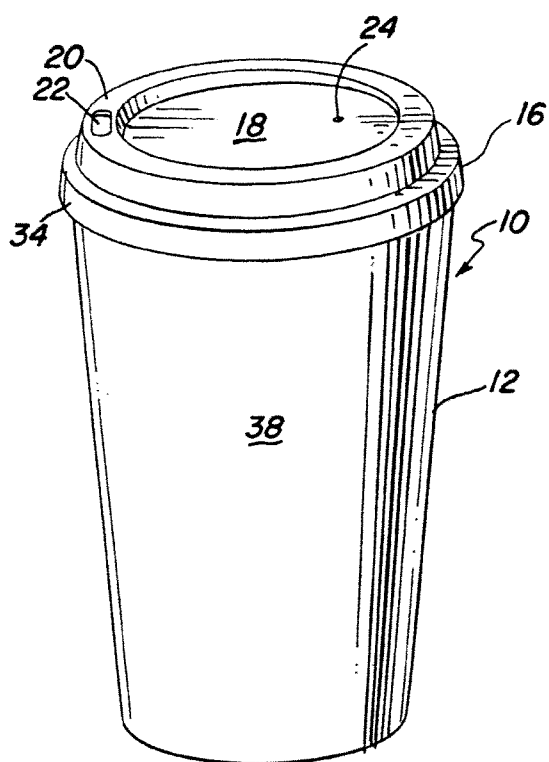


FIG. 1

1/3

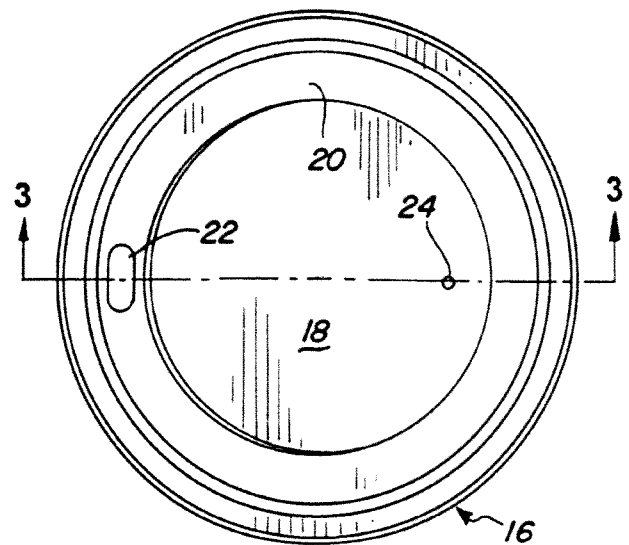


FIG. 2

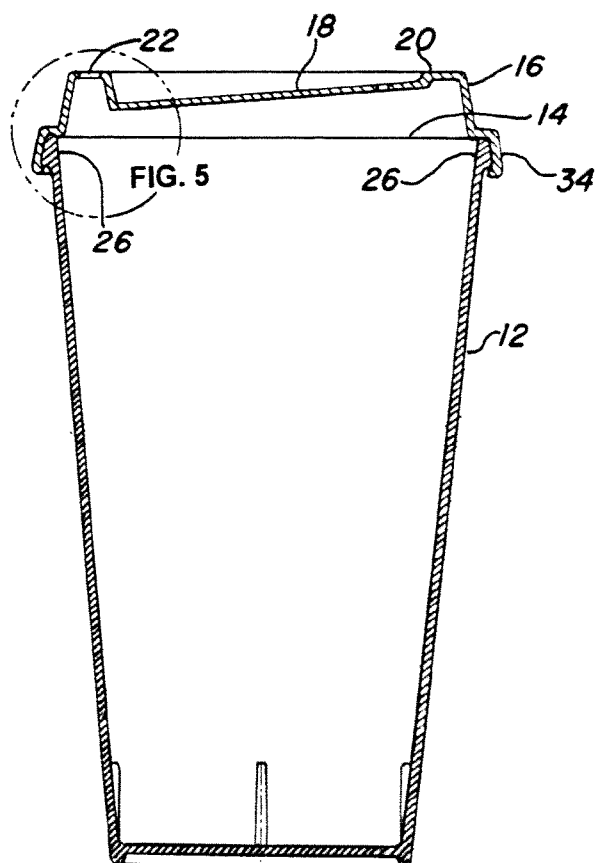


FIG. 3

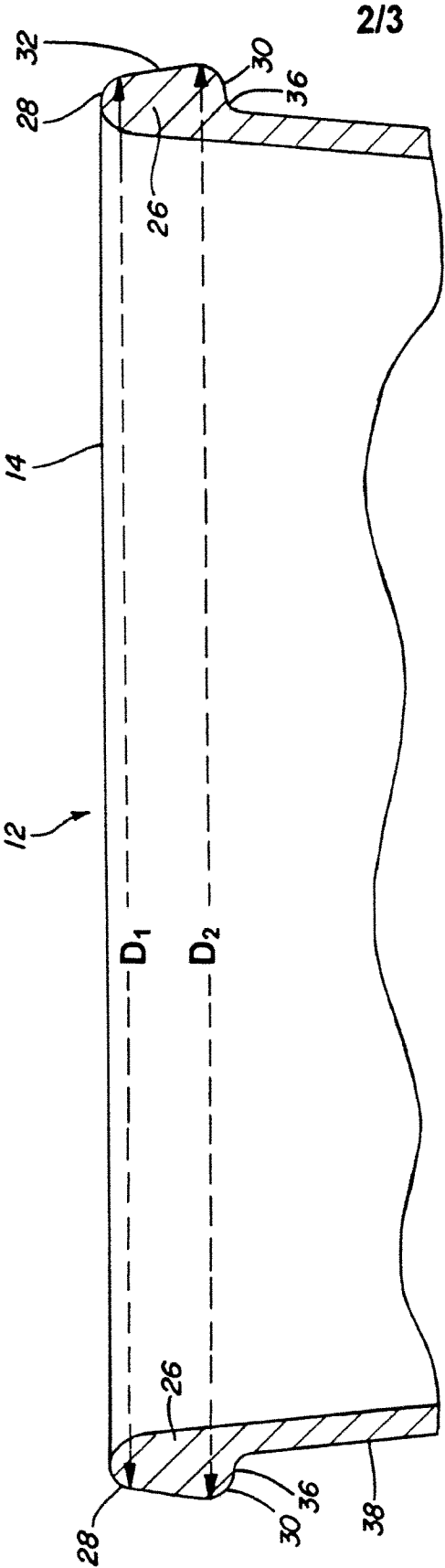
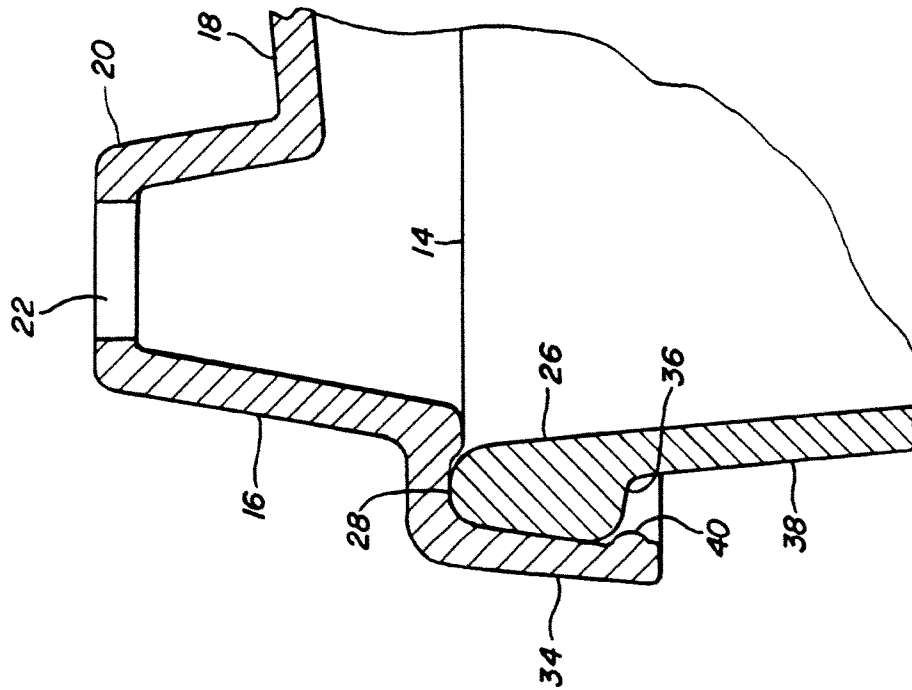
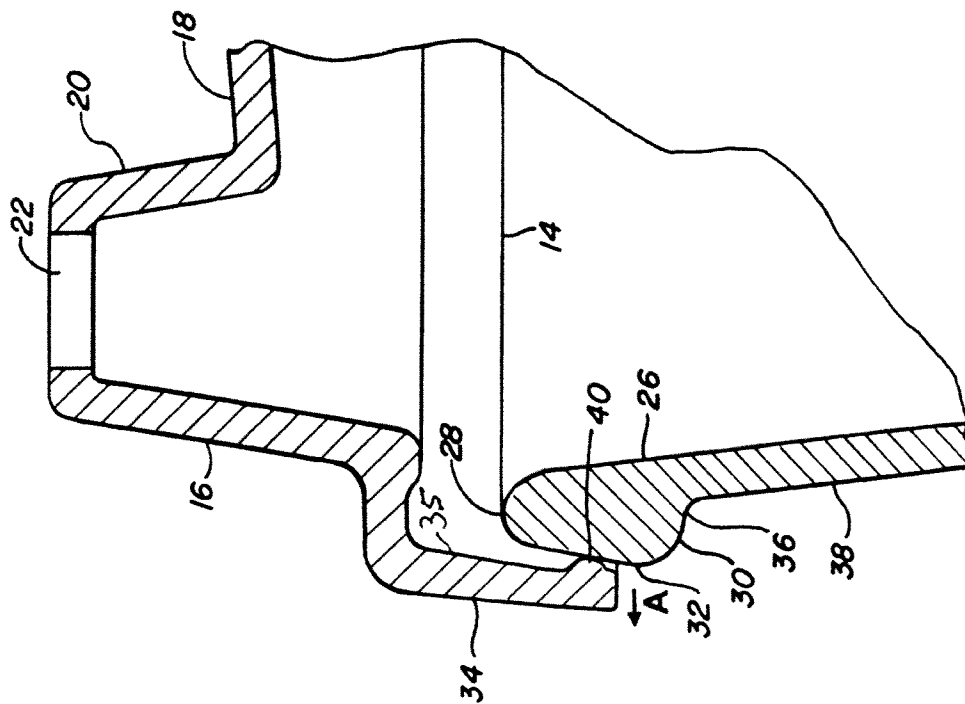


FIG. 4

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**FIG. 5**



**FIG. 6**