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(56) Documents cited
GB 2142911 A GB 2094274 A EP 0148527 A2
US 4076152 A

(58) Field of search
UK CL (Edition K) B8T TBM TCC
INT CL⁵ B65D 51/20

(54) Container closure

(57) A cap closure (12), particularly useful for foil-sealed containers includes threads (16, Figure 1) or snap projections 52 in addition to complementary tapered surfaces 18, 20 on its skirt portion 122 which are adapted to form an interference fit and seal the closure 12 to the neck 10 at a region clear from the lip 30 of the neck 10 and the crown 120 of the closure 12. Any foil seal 28 present on the container neck 10 remains free from contact with the closure 12 during application and tightening. Preferably the neck 10 includes a recessed lip 30, 32 further to protect the seal and to inhibit drop formation. An outer edge of the container lip may be chamfered 26 to provide a pull tab on the foil seal. Additionally, the foil may be of a larger diameter than the lip of the container, so that it provides an overhanging edge of foil to facilitate the removal of the foil, but not of such a large diameter that it touches the inner surface of the closure.

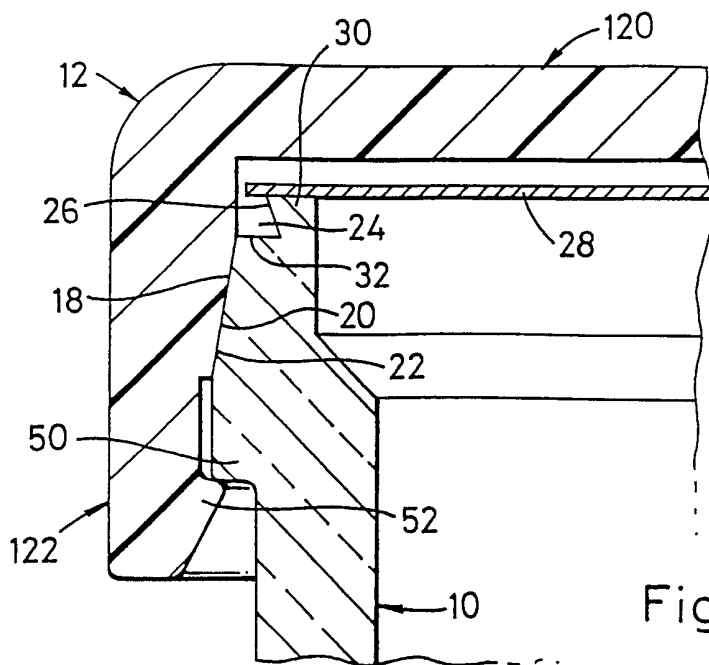


Fig. 2

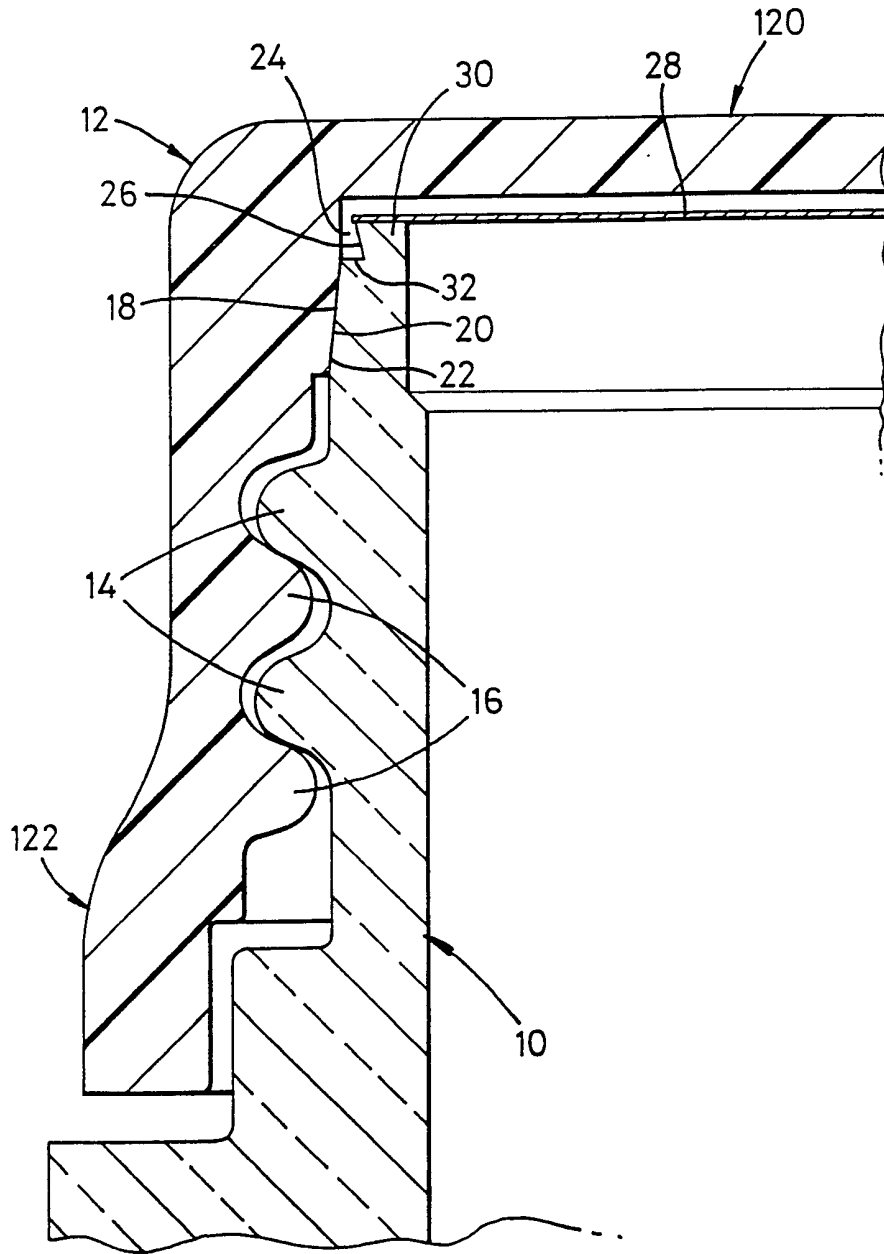


Fig. 1

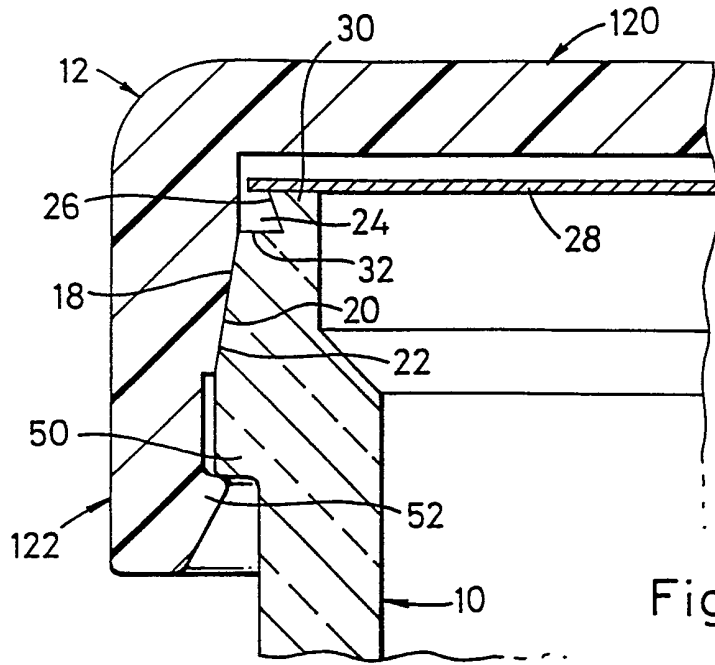


Fig. 2

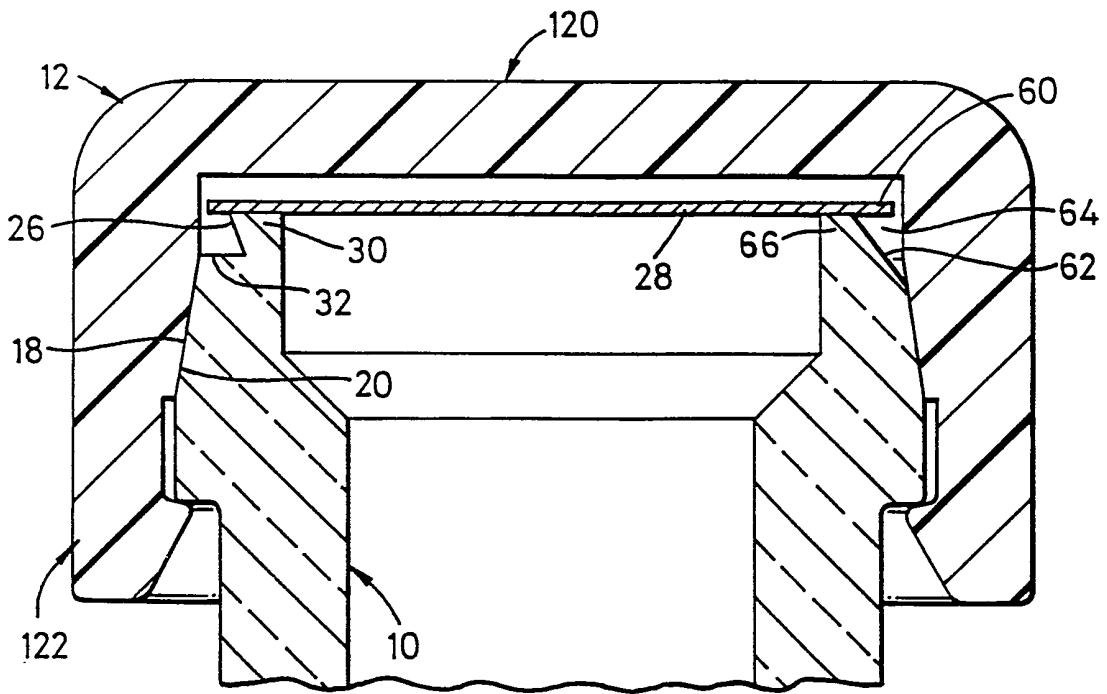


Fig. 3

A Container And Closure

This invention relates to a container closure assembly comprising a container neck and a complementary closure. In particular, the invention relates to such an assembly in which the neck is adapted to carry a sealing web, e.g. a foil seal.

Foil sealed containers are used for a variety of different purposes, particular examples being medicine bottles, coffee jars and drinks containers. Commonly, they are used in applications in which the contents of the container are consumed or exhausted over a fixed or well-defined period of time. In such cases, the foil seal provides that the contents of the container remain uncontaminated, or that they retain their original quality, until the foil seal is broken. A secondary seal, between the container and its complementary closure ensures a degree of protection for the contents of the container which is sufficient to preserve the quality of the contents throughout its consumption or usage period.

It has been common practice for the secondary seal to be provided between the lip of the container neck and the crown of the closure, which has the effect of sandwiching the foil seal between the two. Overtightening of the closure can tear or rupture the delicate foil seal.

This invention seeks to overcome this problem, and accordingly provides a container closure assembly comprising a container neck, a container closure and a thread for retaining the closure on the container neck, wherein the inner surface of a skirt portion of the closure is adapted to seal against the outer surface of the container neck.

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With the above arrangement, the secondary seal remains entirely clear of the lip of the container neck, and therefore of any foil seal or other sealing web which may be

provided thereon.

For additional protection of the sealing web, the assembly may be such that, when the closure is engaged with and sealed to the container neck, a clearance exists between the outer surface of the lip of the container neck and the corresponding inner surface of the closure.

The invention also provides a container closure assembly comprising a container neck, a container closure and means for retaining the closure on the container neck, wherein the inner surface of a skirt portion of the closure is adapted to seal against the outer surface of the container neck and, when the closure is engaged with and sealed to the container neck, a clearance exists between the outer surface of the lip of the neck and the corresponding inner surface of the closure.

This clearance may be afforded by providing the outer surface of the lip with a recess. Preferably, the recess includes a substantially outwardly facing surface which is inclined to the longitudinal axis of the container neck so as to form an overhanging rim on the container. Preferably the inclination of the recess surface is between about 1° and about 45°, preferably about 20°.

Preferably, the container neck includes an outwardly tapered portion and the inner surface of the skirt portion of the closure is adapted to form an interference fit with that tapered portion. This will ensure that no contact, other than accidental contact, occurs between the closure and the lip of the container neck, or any sealing web thereon, during application or tightening of the closure. The skirt portion of the closure can be made large enough to pass over the relatively narrow lip of the container neck and only seal with the neck in a region where the tapered portion is wider.

To provide a good seal, the skirt portion of the closure preferably includes an inwardly tapered surface so as to correspond to the tapered neck. Preferably, the angle of taper is between about 1° and about 45°, most preferably about 1° and about 25°, and in particular about 5°.

In a case where the container neck and closure are of circular section, the means for retaining the closure on the neck preferably includes a thread. Most preferably a thread is provided on the closure and a complementary thread on the container neck.

Alternatively, the skirt portion of the closure may be provided with an inwardly facing deformable projection to engage a complementary outwardly facing projection on the neck. This provides a snap fit closure. Preferably, the projections comprise one or more outstanding beads.

The invention also provides a container neck, adapted to receive a complementary closure and having a sealing web sealed thereto, in which at least a circumferential portion of an outer edge of the lip of the container neck is cut away. This provides that the part of the sealing web which overlies the cut away edge may be used as a pull away tab for the web. Such an arrangement is particularly useful for webs which are adapted to be peeled off.

Preferably the sealing web is at most coextensive with the lip of the container neck. Thus, when the closure is applied, the sealing web is not fouled by the closure.

The cut away edge of the lip may be chamfered, and the container neck, with or without the sealing web may form part of a closure assembly according to the invention.

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The invention will now be described by way of example with reference to the accompanying drawing wherein:

Fig. 1 is a section through a first embodiment of the invention including a threaded closure;

Fig. 2 is a section through a second embodiment, in which
5 the closure snaps onto the container neck; and

Fig. 3 is a section through the embodiment of fig. 2, the lip of which has a chamfered edge.

10 Fig. 1 illustrates a container closure assembly according to the invention including a container neck (10) and a container closure (12). The closure (12) is illustrated in its engaged, sealed position on the container neck (10). In this exemplary embodiment both the neck (10) and the closure
15 (12) are of circular section and are provided with complementary threads (14, 16).

The closure consists of a crown portion (120) and a skirt portion (122). The skirt portion (122) includes an inwardly
20 tapered surface (20) and the container neck (10) includes a corresponding outwardly tapered surface (18). A seal (22) exists between the tapered surfaces (18, 20) by virtue of an interference fit between the two.

25 The lip (30) of the container neck (10) is sealed by a sealing web (28) which, in this exemplary embodiment is a foil seal. The neck (10) and closure (12) are constructed of materials common in the art, e.g. glass, plastics, metal etc.

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As can be seen a clearance (24) exists between the outer surface (26) of the lip (30) and the inner surface of the closure (12). The clearance is of about 1mm and corresponds to a recess (32) in the lip (30). As can be seen, the
35 closure is held away from the edges of the foil seal, to reduce the likelihood of tearing the seal.

Whilst in the embodiment shown in fig. 1 the clearance (24)

is afforded by a recess (32) in the lip (30), it will be appreciated by one skilled in the art that such a clearance may be provided by an appropriate profile on the inner surface of the closure (12), or a combination of profiles on the closure (12) and the neck (10).

The recess (32) includes a substantially outwardly facing surface (26) which is inclined to the axis of the neck (10). This forms a drip-free, overhanging rim.

10

The diameter of the inside surfaces of the closure threads (16) is greater than that of the sealing web or foil (28). The complementary threads (14, 16) may therefore be engaged without any portion of the closure (12) contacting the sealing web (28). Rotation of the closure (12) advances it axially until its tapered surface (20) interferes with that (18) on the neck (10). No stress is applied to the sealing web (28).

20 The secondary seal (22) between the tapered surfaces (18, 20) has been found in shelf tests to be, for practical purposes, of equal integrity to the foil seal itself. This offers a substantial improvement over the prior art.

25 A container closure assembly according to this, or any other embodiment of the invention may for example be applied to the container and closure which forms the subject of our international patent application PCT GB91/00850.

30 Fig. 2 illustrates an assembly similar to that shown in fig. 1, but which includes a snap-fit closure. The closure (12) is, in this embodiment, formed of deformable plastics material. Its skirt portion (122) is provided with an inwardly facing outstanding bead (52) which cooperates with an outstanding projection (50) on the container neck.

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Once again, tapered surfaces (18, 20) are provided on the neck and closure to provide an interference seal (22). The

outer surface of the container lip (30) is again provided with a recess (32) which is, practically, identical to the recess shown in fig. 1. The inside diameter of the bead (52) is greater than the diameter of the sealing web (28).

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As can be seen, the foil is of a larger diameter than is the recessed container lip so as to provide an overhanging edge of foil to facilitate the removal of the foil. Nevertheless, the foil diameter is not so large that the
10 foil makes contact with the inner surface of the cap.

Fig. 3 shows the embodiment of fig. 2 an edge (66) of the lip (30) of which is chamfered. The chamfer results in an inclined surface (62) which creates a space (64) beneath a
15 peripheral portion (60) of the web (28).

This peripheral portion (60) performs the function of a pull tab on the web (28) and is particularly useful when the web (28) is adapted to be peeled off the container lip (30). Of
20 course, the web (28) is still fully sealed to the horizontal surfaces of the lip (30).

It will of course be appreciated that the invention has been described above purely by way of example and that
25 modifications of detail may be made without departing from its scope.

CLAIMS

1. A container closure assembly comprising a container neck, a container closure and means for retaining the
5 closure on the container neck, wherein the inner surface of a skirt portion of the closure is adapted to seal against the outer surface of the container neck and, when the closure is engaged with and sealed to the container neck, a clearance exists between the outer surface of the lip of the
10 neck and the corresponding inner surface of the closure.

2. An assembly according to claim 1 in which the container neck and closure are of substantially circular section and the means for retaining the closure on the neck comprises a
15 thread.

3. An assembly according to claim 2 wherein a thread is provided on the closure and a complementary thread on the container neck.
20

4. A container closure assembly comprising a container neck, a container closure and a thread for retaining the closure on the container neck, wherein the inner surface of a skirt portion of the closure is adapted to seal against
25 the outer surface of the container neck.

5. An assembly according to claim 4 wherein a thread is provided on the closure and a complementary thread on the container neck.
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6. An assembly according to claim 4 or claim 5 in which, when the closure is engaged with and sealed to the container neck, a clearance exists between the outer surface of the lip of the neck and the corresponding inner surface of the
35 closure.

7. An assembly according to any one of claims 1-3 or claim 6 in which the outer lip of the container neck is provided with a recess.
- 5 8. An assembly according to claim 7 in which the recess includes a substantially outwardly facing surface which is inclined to the longitudinal axis of the container neck so as to form an overhanging rim.
- 10 9. An assembly according to claim 8 in which the inclination of that recess surface is about 20 degrees.
10. An assembly according to any preceding claim wherein the container neck is sealed with a sealing web.
- 15 11. An assembly according to claim 10 in which the sealing web is a foil seal.
12. An assembly according to any preceding claim in which
20 the container neck includes an outwardly tapered portion and the inner surface of the skirt portion of the closure is adapted to form an interference fit with that tapered portion.
- 25 13. An assembly according to claim 12 in which the skirt portion of the closure includes an inwardly tapered surface so as to correspond to the tapered neck.
14. An assembly according to any preceding claim wherein
30 the skirt portion of the closure is provided with an inwardly facing deformable projection to engage a complementary outwardly facing projection on the container neck.
- 35 15. An assembly according to claim 14 in which the projections comprise an outstanding bead.
16. A container neck, adapted to receive a complementary

closure and having a sealing web sealed thereto, in which at least a circumferential portion of an outer edge of the lip of the container neck is cut away.

5 17. A container neck according to claim 16 in which the sealing web is at most coextensive with the lip of the neck.

18. A container neck according to claim 17 wherein the circumferential portion is chamfered.

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19. An assembly according to any one of claims 1-15 in which the container neck accords with any one of claims 16-18.

20. A container neck substantially as described herein with
15 reference to fig. 3 of the accompanying drawings.

21. A container closure assembly substantially as described herein with reference to fig. 1, fig. 2 or fig. 3 of the accompanying drawings.

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Relevant Technical fields

(i) UK CI (Edition K) B8T (TBM, TCC)

(ii) Int CL (Edition 5) B65D 51/20

Search Examiner

LINDA HARDEN

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

14.08.92

Documents considered relevant following a search in respect of claims

1-3, 7-15, 19, 21

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2142911 A (HETTICH PLASTICS LTD) - see figure 2	1-3, 10, 11
X	GB 2094274 A (YOSHIDA INDUSTRY) - see figure 1	1-3, 7, 10, 11
X	EP 0148527 A2 (CALWAG) - see figures 1 & 2	1-3, 7, 10, 11
X	US 4076152 (MUMFORD) - see figure 2	1-3, 7-11

Category	Identity of document and relevant passages	Relevance to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

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