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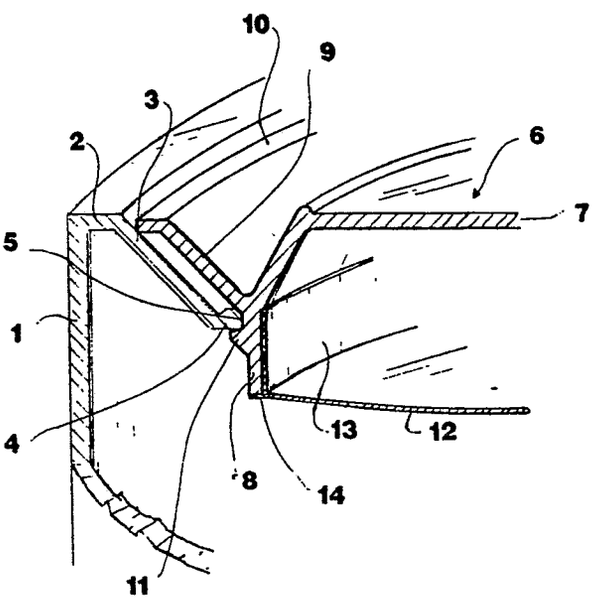
(54) Container Closure.

(57) A container closure for an open-ended container (1) comprising an outer wall (7), an inner wall (12) and a side wall (8) said walls together forming an essentially airtight air space, the exterior side of the side wall being sealingly engageable with the inside of the walls of the open-ended container and the side wall of the closure being more easily deformable than the outer wall.

A container fitted with a closure of the invention exhibits a high resistance against leakage if dropped on the floor.



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Container Closure

This invention relates to a container closure for an open-ended container comprising an outer wall, an inner wall and a side wall, said walls together forming an air space and wherein the exterior side of the side wall is sealingly engageable with the inside of the walls of the open-ended container.

Open-ended containers comprising closures of the above-mentioned type are disclosed in Danish patent specification No. 138839, European patent publication No. 0 139 077 and US patent specification No. 4,295,578.

The closures of these known containers comprise means for causing the inner wall of the closure to distend thereby drawing the side wall inwardly during opening and closure of the container and out of sealing contact with the inside of the walls of the container.

British patent specification No. 2 058 026 discloses a similar container closure as well as a closure comprising means for distending the outer wall of the closure during opening and closure of the container.

When used in the packaging of heavy materials such as liquids and more particularly paints containers comprising the prior art closures suffer from the defect that the containers tend to leak or that the closures even tend to be disengaged from the containers if the containers with their contents are subject to strong impacts, e.g. are dropped on the floor.

The object of the invention is to provide a container closure of the above-mentioned type which prevents leakage and which is not disengaged from an open-ended container if the container with contents is subject to strong mechanical forces, such as impacts, e.g. in connection with the dropping of the container on the floor.

This object and other objects which will appear from the following description are obtained with the closure of the invention which closure comprises a side wall which is more easily deformable than the outer wall and which comprises an essentially airtight air space.

When a container comprising a closure of the type in question and containing a heavy material is dropped on the floor the inner wall is forced outwards as a result of the increased air pressure and the pressure exerted thereon by the contents of the container.

By using a closure of the invention such deformation of the inner wall will cause the pressure in the air space of the closure to be increased and the increased pressure will cause the side wall to distend. Thus the pressure exerted on the inside of the container walls will be increased and consequently the risk of leakage or disengagement of the closure is reduced.

In a preferred embodiment of the closure of the invention the side wall of the closure forms an integral part of the outer wall and the inner wall comprises a peripheral annular flange in sealing contact with the inside of the side wall.

This embodiment is particularly advantageous because it allows the side wall to be relatively thin and because both parts can be produced by injection moulding and easily can be assembled to form the finished closure.

The inner wall of the closure is preferably concave so as to further increase the pressure within the air space when the inner wall is deformed.

The above-mentioned embodiments provide a particularly effective seal between the inner wall and the side wall of the closure when the inner wall comprises an annular extending flange covering the free edge of the side wall.

By subjecting a container comprising a closure of the invention and a container comprising a conventional closure and both containing a liquid to a standard fall test it has been found that the maximum safe fall distance is about 15 cm for a container comprising a prior art closure and 55 - 60 cm for a container with a closure of the invention.

The invention will be described in further detail with reference to the drawing which shows a perspective and partially sectional view of a container comprising a preferred embodiment of the closure of the invention. The drawing shows an open-ended container 1 having at its open end an end flange 2 which is connected with an inclined inwardly extending flange 3 terminating in an annular bead 4. The container also comprises a closure 6 having a plane outer wall 7, a side wall 8 and an outwardly extending inclined flange 9 having at its periphery a flange 10 which is in contact with the flange 3 when the closure 6 is applied to the container 1. The exterior side of the side wall 8 comprises an annular bead 11 which together with the inclined flange 9 form an annular recess for the annular bead 4 on the container.

The closure 6 also comprises an inner wall 12 having an annular flange 13 which is airtightly in contact with the inner side of the side wall 8 and an outwardly extening annular flange 14 which fits sealingly to the free edge of the side wall 8.

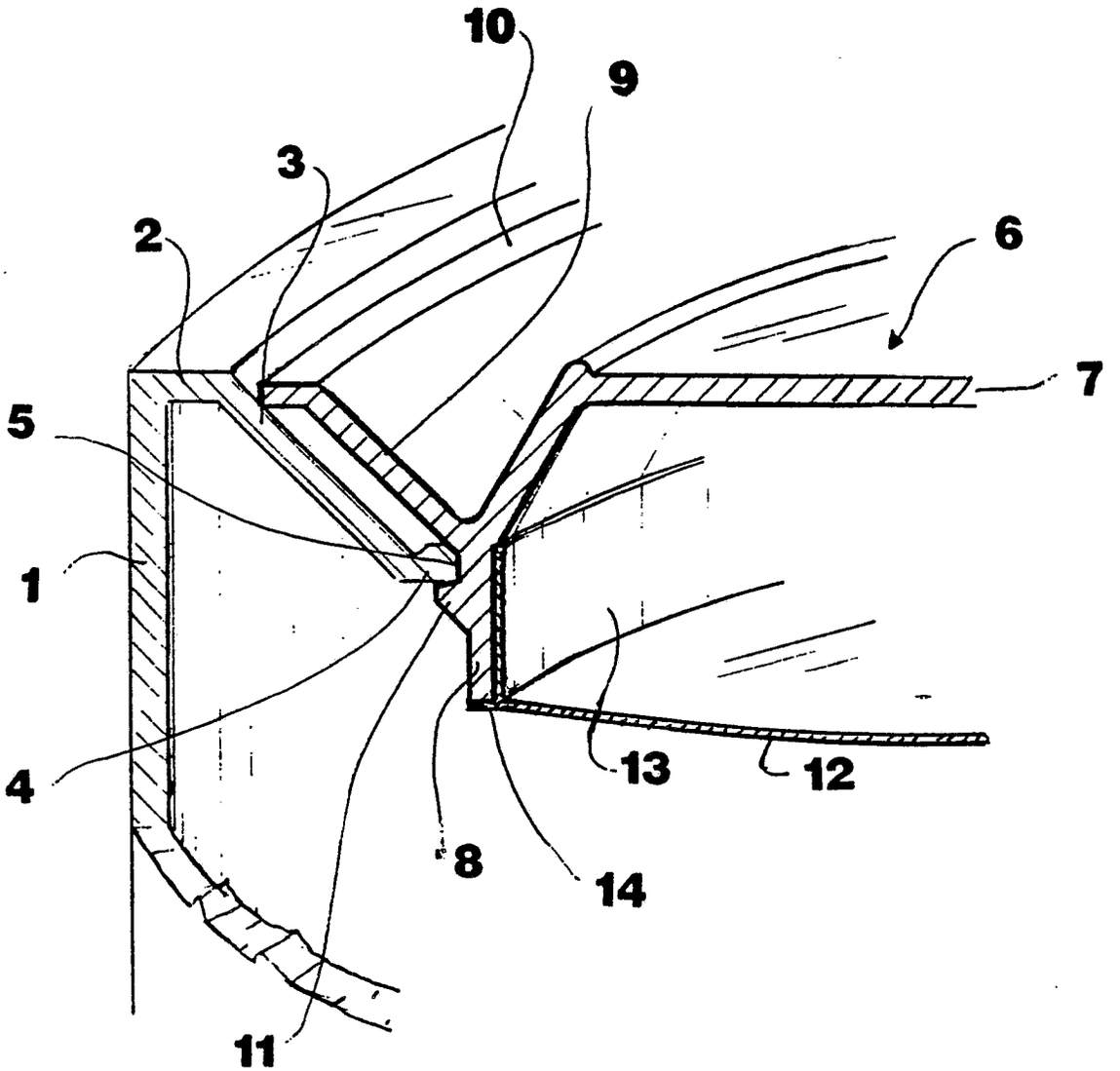
Claims

1. A container closure for an open-ended container comprising an outer wall, an inner wall and a side wall said walls together forming an air space, and wherein the exterior side of the side wall is sealingly engageable with the inside of the walls of the open-ended container **characterized** in that the side wall of the closure is more easily deformable than the outer wall and that the air space is essentially airtight.

2. A container closure as in claim 1, **characterized** in that the side wall forms an integral part of the outer wall and that the inner wall comprises a peripheral annular flange which is in sealing contact with the inner side of the side wall.

3. A container closure as in claim 1 or claim 2, **characterized** in the inner wall is concave.

4. A container closure as in claim 2, **characterized** in that the inner wall comprises an outwardly extending annular flange covering the free edge of the side wall.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EUROPEAN SEARCH REPORT

Application Number

EP 88 11 3002

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	US-A-2 751 073 (E.I. DU PONT DE NEMOURS) * Whole document * -----	1	B 65 D 39/12 B 44 D 3/12

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

B 65 D
B 44 D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	18-11-1988	MARTIN A.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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