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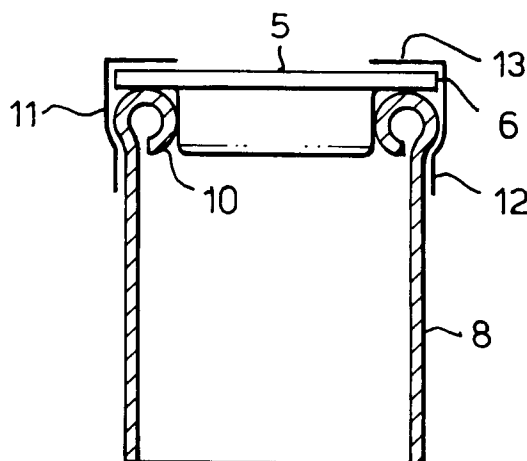
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(54) Paperboard tube with tamper evident closure

(57) A tamper evident packaging container (9), particularly suitable for retail sale of food ingredients comprises a tubular body e.g. of paperboard (8) having a lower end closed by a base and an upper end defining a mouth through which product may be removed from the container. A lid (5) which is a push-fit with the upper

end of the container is provided for closing the mouth. The body (8) exhibits, in the region of the mouth, an external bulge for retaining a tamper evident shrink sleeve (11) which must be destroyed to remove the lid from the body. The bulge is formed by an inward curled bead (10) formed from the material of the body.

Fig.3.



Description

[0001] This invention relates to tamper evident packaging, and more particularly to a tamper evident packaging container in which the body of the container is formed by a cylindrical tube, for example a paperboard tube.

[0002] Packaging containers having a body formed by a paperboard tube are well known and are extensively used for the retail sale of food ingredients. Typically, such containers have a right-circular cylindrical paperboard tube body which is closed at the lower end thereof by a suitable base. At the upper end of the body an inward curl is formed and a moulded plastics lid is push-fitted into the mouth formed by the curl to close the container. Such lids are readily removable and replaceable so that the contents of the container can be used over a significant period, and the container re-sealed between uses.

[0003] In conventional containers of the above type the external diameter of the container is substantially constant over the entire height of the container. The inward curl forms a mouth which has a diameter less than the external diameter of the container, and the lid includes a bung portion which fits within the mouth and a flange which rests on top of the curl to limit the inward movement of the lid. The flange has a diameter substantially equal to that of the paperboard body.

[0004] Heretofore, no satisfactory solution exists for rendering such containers tamper evident. The containers are typically used for relatively inexpensive foodstuffs and the unit cost of the containers must accordingly be kept low. One of the most convenient methods of providing low cost tamper evidence on containers with removable lids, namely the provision of a shrink sleeve around the lid and a portion of the body, is not applicable to this type of container because of the substantially constant external diameter of the container. In the circumstances, in the past if such containers are to be rendered tamper evident relatively expensive or inconvenient solutions have been adopted.

[0005] According to one aspect of the present invention there is provided a tamper evident packaging container comprising a tubular body having a lower end closed by a base and an upper end defining a mouth through which product may be removed from the container; and a lid which is a push-fit with the upper end of the container for closing the mouth, wherein the body exhibits, in the region of the mouth, an external bulge for retaining a tamper evident shrink sleeve which must be destroyed to remove the lid from the body.

[0006] Preferably, the body is a paperboard tube which is preferably of circular or oval cross-section. In the preferred embodiment of the invention the paperboard tube is formed with an inward curled bead at the upper end thereof to define the mouth. The bead is so shaped that although it is inwardly curled, the initial transition from the uniform diameter body to the bead is in

the form of an outward deformation of the body. This outward deformation provides the bulge for retaining the tamper evident sleeve.

[0007] Preferably, the lid includes a bung portion which is a push-fit within the bead and a flange portion which overlies the bead to limit the depth to which the bung portion is inserted. Preferably, tamper evident sleeve overlies a portion of the flange.

[0008] The invention will be better understood from the following description of a preferred embodiment thereof, given by way of example only, reference being had to the accompanying drawing wherein:

Figure 1 is a schematic cross-sectional view of the upper portion of a conventional paperboard packaging container illustrating the effect of a shrink sleeve as a tamper evident device;

Figure 2 is a cross-sectional view of a preferred embodiment of the invention; and

Figure 3 illustrates the container of Figure 2 having a tamper evident sleeve applied thereto

[0009] Throughout the drawings clearances between various components, and in particular between the lid and body on the one hand and the tamper evident sleeve on the other hand have been exaggerated in the interests of clarity. In practice, the tamper evident sleeve will be shrunk into close engagement with the lid and body.

[0010] Referring firstly to Figure 1, the upper portion of a typical prior art packaging container 1 is shown. The container comprises a body 2 formed by a paperboard tube. As will be appreciated by those skilled in the art, the lower end of the body 2 will be closed by an appropriate base. The exact nature of the base is not relevant to the present invention.

[0011] The upper end of the body 2 is formed with an inwardly curled bead 3 which serves a number of functions. More particularly, the bead 3 reinforces the upper end of the body and defines a mouth in which the bung portion 4 of a lid 5 may be inserted to close the container. The elasticity of the lid 5 and body 2, enhanced by the bead 3, mean that the lid 5 can be made a comfortably tight push-fit within the mouth in order to prevent loss of product from the container and substantially to isolate the contents of the container from the surrounding atmosphere. The upper surface of the bead 3 provides a stop surface against which a flange 6 of the lid engages in order to limit the inward movement of the bung 4 into the mouth. Containers of the type shown in Figure 1 are extensively used for the retail sale of food ingredients, for example herbs and spices.

[0012] In Figure 1 a tamper evident shrink sleeve 7 is shown schematically. Such shrink sleeves are well recognised in the packaging art and are applied to containers after filling in order to provide evidence that the lid of the container has subsequently been removed. The sleeves are shrunk into engagement with the container

and cannot be removed without tearing a portion of the sleeve, which provides evidence of opening of the container. It will be noted, however, that if a shrink sleeve 7 is applied to a container illustrated in Figure 1 it will not be effective because of the substantially constant external diameter of the container. Typically, the paperboard of the body 2 will have a glazed external surface and accordingly by careful manipulation it will be possible to remove the lid 5 without breaking the flangeable portion of the sleeve 7, and subsequently to replace the lid 5 and re-position the skirt portion of the shrink sleeve 7 over the upper portion of the body. A shrink sleeve accordingly does not provide satisfactory tamper evidence for a container of the type shown in Figure 1.

[0013] Figure 2 illustrates an embodiment of the invention. Again, the body 8 of the container 9 is formed by a paperboard tube. The paperboard tube will be closed at the lower end by a suitable base. An inward curl 10 is provided at the upper end of the tube to form a mouth for receipt of a lid 5 of conventional form. It will be noted, however, that although the bead 10 is curled inwardly, the initial transition from the cylindrical external surface of the body 8 to the bead 10 is in the radially outward direction. Accordingly, the bead forms a bulge in the external surface of the body the radial extent of the bulge being determined by the profile of the bead 10. The bulge provides an increase in the external radius of the body by an amount A, and accordingly an increase in the external diameter of 2A.

[0014] In Figure 3, the container of Figure 2 is illustrated with a tamper evident shrink sleeve 11 applied to the upper end thereof. The lowest portion 12 of the shrink sleeve has been shrunk into contact with the normal external diameter of the body 8. The uppermost portion 13 of the sleeve overlies the flange 6 of the lid. Because of the bulge in the external diameter of the body provided by the bead 10 the sleeve cannot be removed from the body simply by sliding in the upward direction as viewed in Figure 3. Accordingly, the sleeve must be destroyed in order to remove the lid 5 from the container, thereby providing the required degree of tamper evidence.

[0015] The bead profile 10 required for the purposes of the present invention can be formed by rolling an inwardly curled bead in a conventional manner and then applying a rotating former to the interior surface of the bead to apply outward force thereto. By this means, the bead may be deformed outwardly to provide the offset A required for the purposes of the present invention.

tainer for closing the mouth, wherein the body exhibits, in the region of the mouth, an external bulge for retaining a tamper evident shrink sleeve which must be destroyed to remove the lid from the body.

2. A tamper evident packaging container according to Claim 1 wherein, the body is a paperboard tube.
3. A tamper evident packaging container according to Claim 2 wherein the paperboard tube is of circular or oval cross-section.
4. A tamper evident packaging container according to Claim 2 or Claim 3 wherein the paperboard tube is formed with an inward curled bead at the upper end thereof to define the mouth.
5. A tamper evident packaging container according to Claim 4 wherein the bead is so shaped that although it is inwardly curled, the initial transition from the uniform diameter body to the bead is in the form of an outward deformation of the body to provide said external bulge.
6. A tamper evident packaging container according to any preceding claim wherein the lid includes a bung portion which is a push-fit within the mouth.
7. A tamper evident packaging container according to Claim 6 wherein the lid includes a flange portion which overlies the upper end of the container to limit the depth to which the bung portion can be inserted.
8. A tamper evident packaging container according to Claim 7 wherein the tamper evident sleeve overlies a portion of the flange.

Claims

1. A tamper evident packaging container comprising a tubular body having a lower end closed by a base and an upper end defining a mouth through which product may be removed from the container; and a lid which is a push-fit with the upper end of the con-

Fig.1.

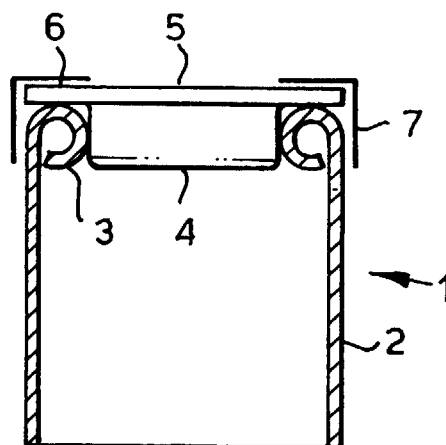


Fig.2.

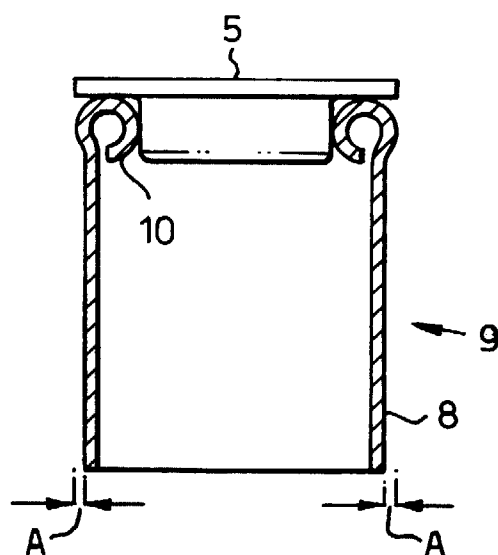
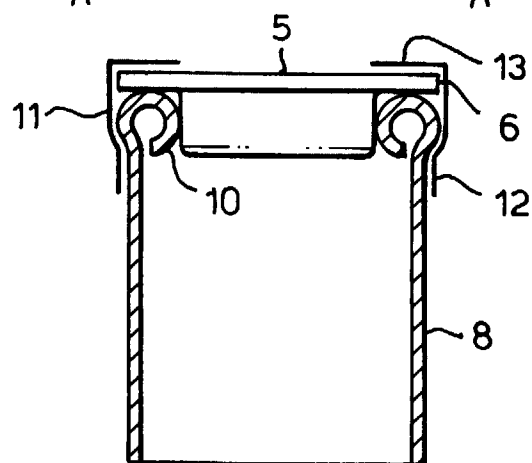


Fig.3.





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EUROPEAN SEARCH REPORT

Application Number
EP 99 30 2729

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.6)
Y	GB 2 314 827 A (ROBINSON & SONS LTD) 14 January 1998 (1998-01-14) * abstract; figures 1-3 *	1-8	B65D3/28 B65D3/02 B65D55/08
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A	GB 2 017 042 A (WADDINGTONS LTD) 26 September 1979 (1979-09-26) * abstract; figures *	1-3	
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 22 July 1999	Examiner SERRANO GALARRAGA, J
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

EPO FORM 1503 03.82 (F04.031)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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