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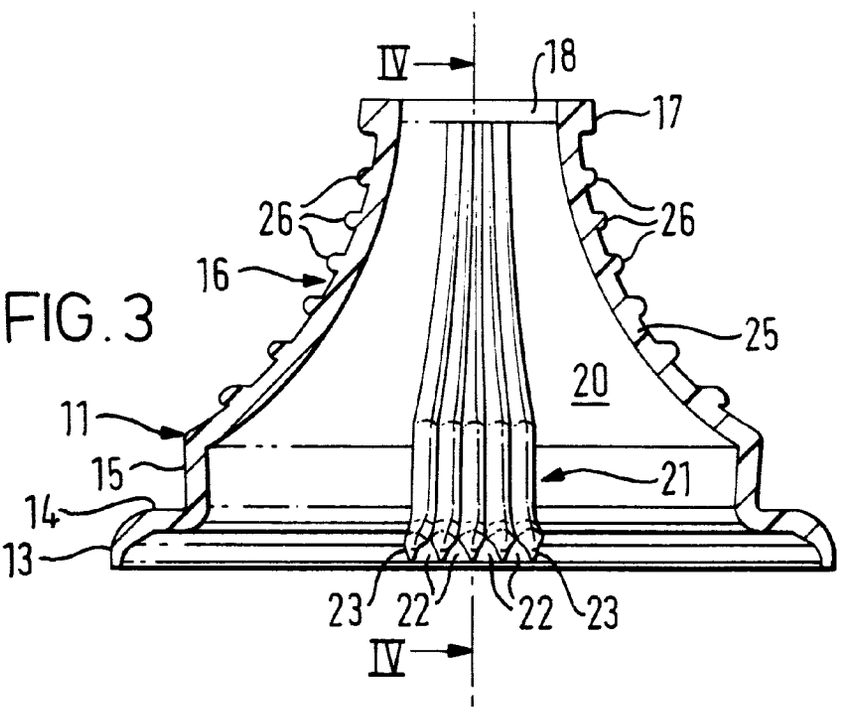
(54) Collapsible tube containers

(57) A shoulder (11) for a collapsible tube container, the shoulder having a nozzle (17) with an outlet port (18) for expulsion of material from the container. The shoulder has an enhanced tendency to collapse by the provision of a plurality of adjacent flutes (23) on its internal surface, which form areas of weakness enabling the shoulder to collapse if squeezed across a diameter.

FIG. 3



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Description

This invention relates to collapsible tube containers and to shoulders of collapsible tube containers.

Collapsible containers that dispense semi-solid pastes, creams, ointments and medicaments etc. are well known. Containers of the kind are usually made from metal or plastics tubes, one end of which is closed by a welded or pinched seam, and at the other end of which is secured a shoulder having a discharge nozzle formed thereon.

The prior art containers of the above type tend to retain a proportion of the contents of the tube so that they are difficult to empty completely of their contents. This is particularly so for plastics containers which are not permanently deformable in the manner of metal collapsible containers.

One method of making a collapsible plastics container is shown in GB-A-732,761. The container disclosed therein has a tube extending from the nozzle to the bottom of the container and through which ink is drawn by a suction pump. The shoulder of the tube is provided with diametrically spaced apart radial grooves which provide weakened zones which allow the shoulder and container to fold or collapse, in a desired manner, under atmospheric pressure on evacuation of the container.

The present invention provides a tube container which is easily collapsible under manually applied loads and which externally has the appearance of a conventional tube container.

Accordingly there is provided a shoulder for a collapsible tube container, the shoulder including a nozzle having an outlet port whereby material is expelled from the container, the shoulder having at least one area of weakness formed by a plurality of adjacent flutes on its internal surface, to enable it to collapse in a desired manner if squeezed across a diameter.

The shoulder preferably includes a skirt, a conical portion extending radially inwardly of the skirt, and the flutes extend from the nozzle outlet port to the skirt.

Preferably the flutes are arranged in spaced groups of a plurality of flutes, preferably between 3 and 7 flutes. The minimum wall thickness of the shoulder in the flutes is about one half of the wall thickness of the tube shoulder in unfluted portions.

The flutes may be arranged in two diametrically spaced groups. Surface indentations for a finger and thumb of a user may be arranged on the external surface of the shoulder to aid squeezing of the shoulder, and may be diametrically spaced on a diameter normal to that of the two spaced groups of flutes.

The external surface of the indentations may be ribbed or hatched to provide a non-slip surface.

Also according to the invention there is provided a collapsible or flexible tube container having a shoulder as described above.

The invention will now be described by way of example only, and with reference to the accompanying drawings in which:-

Figure 1 is an isometric view of an embodiment of tube shoulder according to the present invention;

Figure 2 is a partial plan view of the shoulder of Figure 1;

Figure 3 is a sectional view on the line III-III of Figure 2;

Figure 4 is a partial sectional view on the line IV-IV of Figure 3 also showing a portion of a tube attached to the shoulder;

Figure 5 is a partial plan view of a second embodiment of shoulder according to the invention;

Figure 6 is a side elevational view of the shoulder of Figure 5, partially sectioned on the line VI-VI of Figure 5; and

Figure 7 is an enlargement of a detail of Figure 5.

With reference to Figures 1 to 4 there is shown a plastics shoulder 11 which in use is welded to the end portion of a flexible plastics tube 12 (see Figure 4), the other end (not shown) of which will typically be closed by a welded seam after filling the tube with the material to be stored therein.

The shoulder 11 includes a lower skirt portion 13 which is a sliding fit within the tube 12 and to which the tube 12 is welded by a suitable method. The skirt 13 is connected to a radially inner cylindrical portion 15 by a radially inwardly extending shoulder portion 14. The cylindrical portion 15 is connected to a concavely curved conical portion 16 which extends both axially away from the skirt 13 and radially inwardly to form a nozzle 17 having an outlet port 18 therein.

On the internal surface 20 of the shoulder 11 are located circumferentially spaced groups 21 of flutes. In the embodiment illustrated there are two groups 21 of flutes located diametrically opposite each other, but other number of groups could be used. The groups 21 of flutes essentially comprise four ribs 22, each having a flute (or groove) 23 on each side thereof. The grooves 23 may be 'V' shaped cross sectional grooves as shown, or could be 'U' shaped cross-sectional grooves to improve the resistance to stress cracking. The grooves 23 have a depth which is approximately one half of the general thickness of the surrounding shoulder 11. The upper surface of the ribs 22 is substantially level with the internal surface 20 of the shoulder 11.

In each group 21 of flutes there are preferably between 3 and 7 ribs 22. More preferably, each group has four ribs 22 and five grooves, which extend from the outlet port 18 in an axial direction on the internal surface of

the shoulder and terminate at the skirt 13. The groups 21 of flutes form areas of weakness in the wall of the shoulder 11, so that if squeezed across a diameter normal to the diameter across the groups 21, the shoulder 11 will collapse.

In order to facilitate the squeezing of the shoulder 11, a pair of indentations 25 are formed in the conical portion 16 of the shoulder to provide locations for a finger and thumb of a person using the container. The external surfaces of the indentations 25 have ribs 26 formed thereon to provide a non-slip surface. Other non-slip surfaces could also be used as alternatives to ribs, for example a square cross hatched surface, or a roughened matt surface.

The cylindrical portion 15 has a slight reverse taper to produce a detent over which a closely fitting cap (not shown) can be secured using a snap-fit type construction.

A substantially similar shoulder 111 is shown in Figures 5 to 7, the only difference from the previously described shoulder being that the cap (not shown) is secured to the shoulder 111 by a screw threaded connection 112. The screw threaded connection 112 is in the form of a three start thread, the lower end of each thread portion having an axial extension 113 extending downwardly therefrom. The axial extension 113 has inclined vertical faces 114 which are about 90° apart and form surfaces for engagement with a cooperating formation (not shown) on the thread of the cap, to form an anti-back-off device. This prevents the cap from partially loosening after being screwed tightly onto the shoulder.

In yet another embodiment (not shown) the whole internal surface 20 of the shoulder could be covered in a plurality of adjacent axial flutes. The flutes could in this example be wider at their radially inner end portions than at their outer end portions adjacent the skirt 13.

The use of axial fluting provides for a controlled collapse when the shoulder 11 (or 111) is squeezed across a diameter, but still maintains strength in the axial direction.

A container having a shoulder of the type shown in Figures 1-4 or 5-7 will retain about 5% of its contents, as compared with a container having a conventional non-collapsible shoulder which will typically retain about 10% of its contents.

Claims

1. A shoulder (11) for a collapsible tube container, the shoulder including a nozzle (17) having an outlet port (18) whereby material is expelled from the container, characterized in that the shoulder (11) has at least one area of weakness (21) formed by a plurality of adjacent flutes (23) on its internal surface (20), to enable it to collapse in a desired manner if squeezed across a diameter.

2. A shoulder as claimed in claim 1, wherein the shoulder (11) comprises a skirt (13), and a generally conical portion (16) extending radially inwardly and axially away from the skirt (13), the flutes (23) extending from the nozzle outlet port (18) to the skirt (13).

3. A shoulder as claimed in claim 1 or claim 2, wherein the flutes (23) are arranged in spaced groups (21), each comprising a plurality of flutes (23).

4. A shoulder as claimed in claim 3, wherein each group (21) of flutes (23) comprises between 3 and 7 flutes (23), and preferably 5 flutes (23).

5. A shoulder as claimed in any one of claims 1 to 4, wherein the minimum wall thickness of the shoulder (11) in the flutes (23) is about one half of the wall thickness of the shoulder in unfluted portions.

6. A shoulder as claimed in any one of claims 1 to 5, wherein the width of the grooves in the fluted area (s) decreases from the shoulder skirt (13) towards the nozzle outlet port (18).

7. A shoulder as claimed in any one of claims 1 to 6, wherein the shoulder (11) has two diametrically spaced groups (21) of flutes (23) on its radially inner surface (20).

8. A shoulder as claimed in claim 1 or claim 2, wherein the whole of the inner surface (20) of the shoulder is fluted.

9. A shoulder as claimed in claim 8, wherein the ribs (22) formed between the flutes (23) are wider at their ends adjacent the nozzle outlet port (18) than at their ends adjacent the skirt (13).

10. A shoulder as claimed in any one of claims 1 to 9, wherein the outer surface of the shoulder (11) is formed with a pair of diametrically opposite surface indentations (25) for a finger and thumb of the user.

11. A shoulder as claimed in claim 10, when dependent upon claim 7, wherein the external surface indentations (25) are arranged on a diameter normal to the diameter across the two groups (21) of flutes (23).

12. A shoulder as claimed in claim 11, wherein the external surface indentations (25) each have a non-slip surface (26) thereon.

13. A collapsible tube container characterized in that it includes at one end thereof a shoulder (11) as claimed in any one of claims 1 to 12.

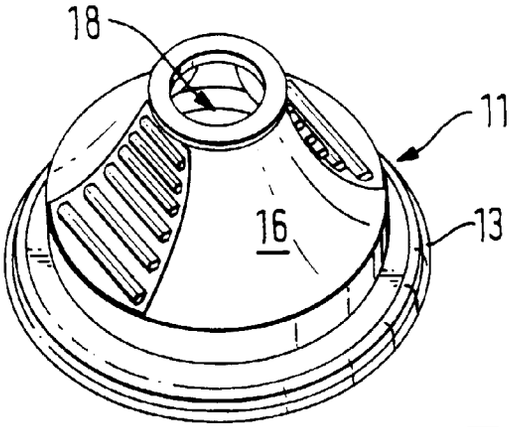


FIG. 1

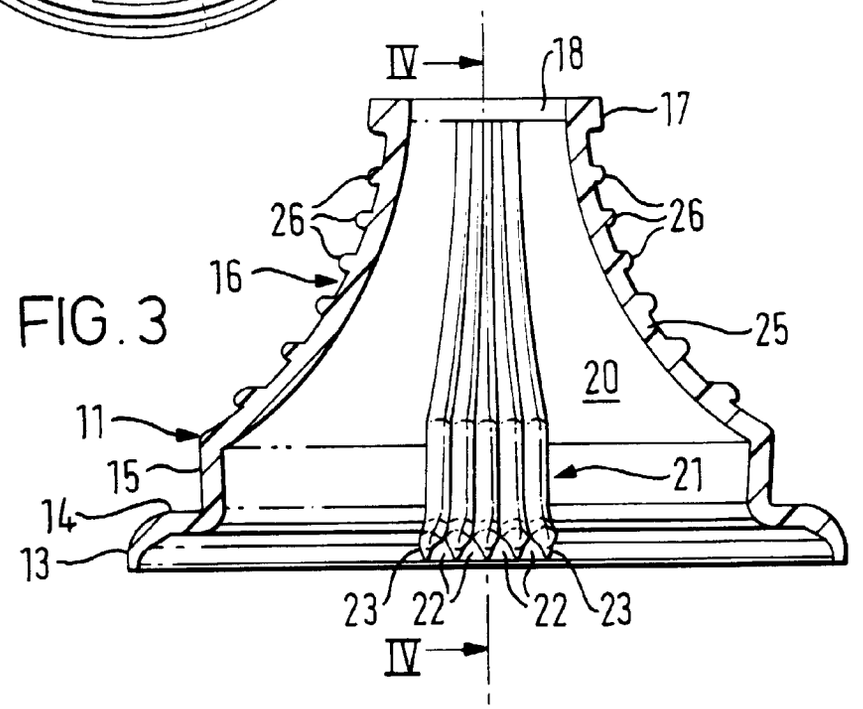


FIG. 3

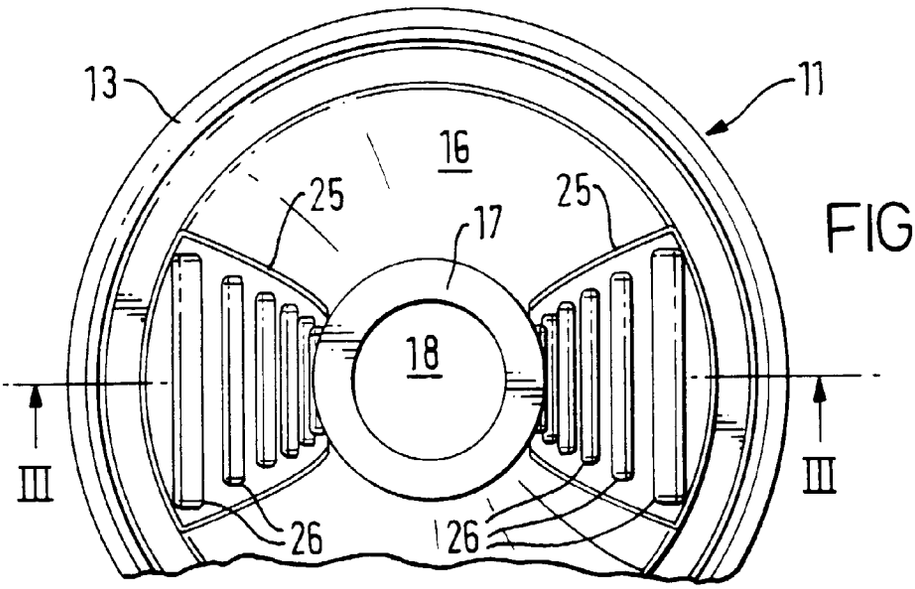


FIG. 2

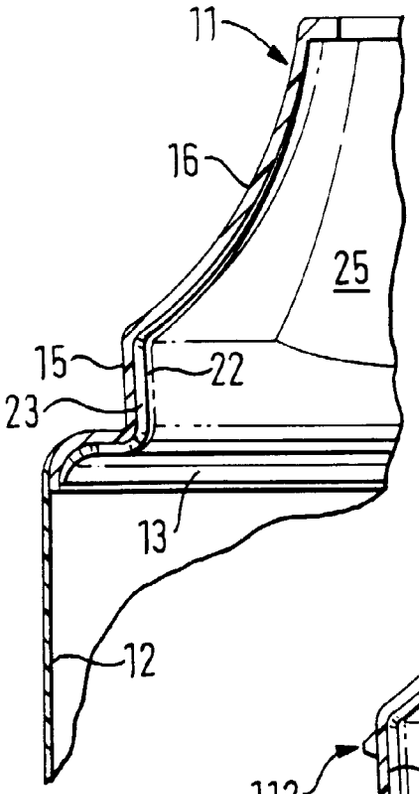
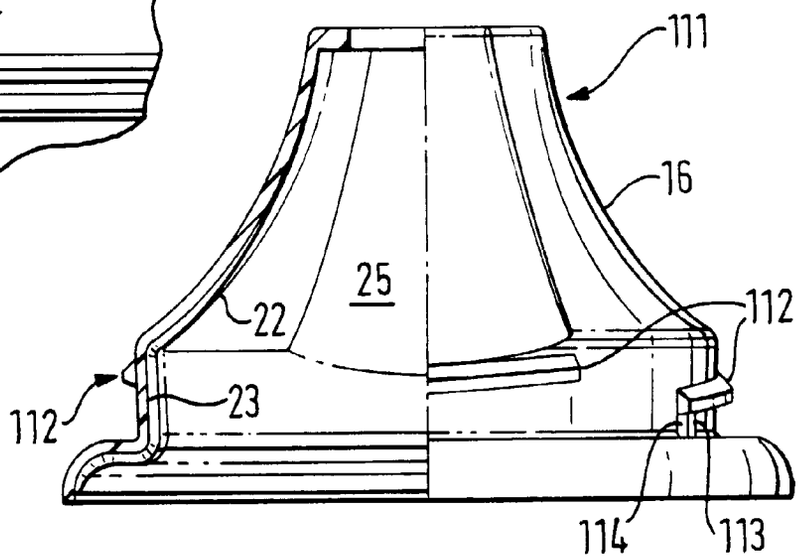


FIG. 4

FIG. 6



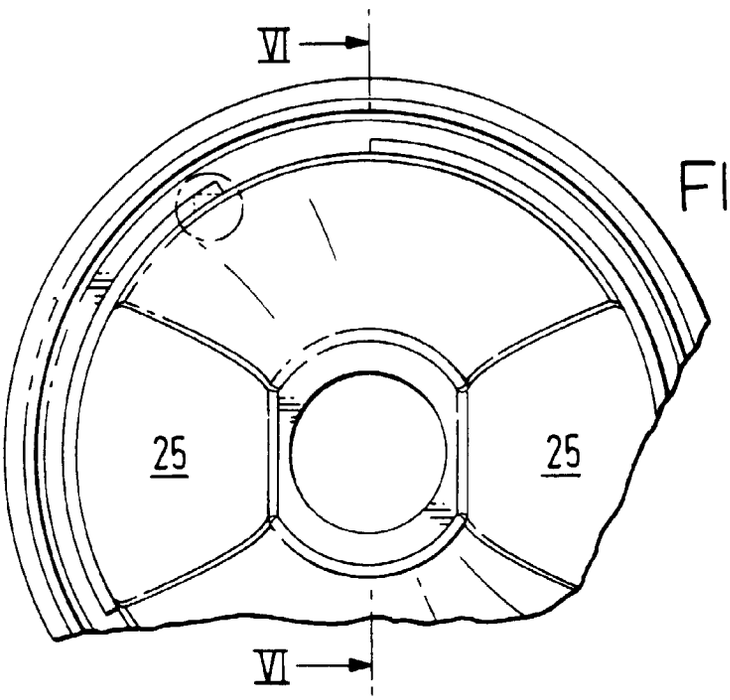


FIG. 5

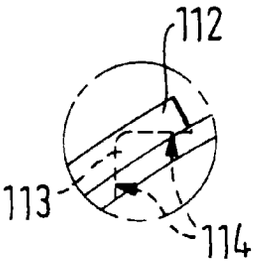


FIG. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 97 30 9516

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)
X Y	FR 2 619 790 A (CEBAL) * the whole document *	1,3,5,13 8	B65D35/10
Y	FR 1 579 619 A (SPIESS & SOHN) * page 2, line 5-29; figures 1,2 *	8	
A	EP 0 017 941 A (NOVA MEDIA) * abstract; figure 1 *	1	
A	US 2 723 779 A (PARKER) * column 3, line 73 - column 4, line 17; figures 9,11 *	1	
A	WO 93 12012 A (SIKA ROBOTICS) * page 3, paragraph 8 - page 4, paragraph 1; figure 1 *	10	
A	CH 574 849 A (DENNLER) * the whole document *	12	
A	EP 0 351 925 A (COLGATE-PALMOLIVE) * abstract; figure 1 *		TECHNICAL FIELDS SEARCHED (Int.Cl.6) B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	19 February 1998	Lenoir, C

CATEGORY OF CITED DOCUMENTS

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