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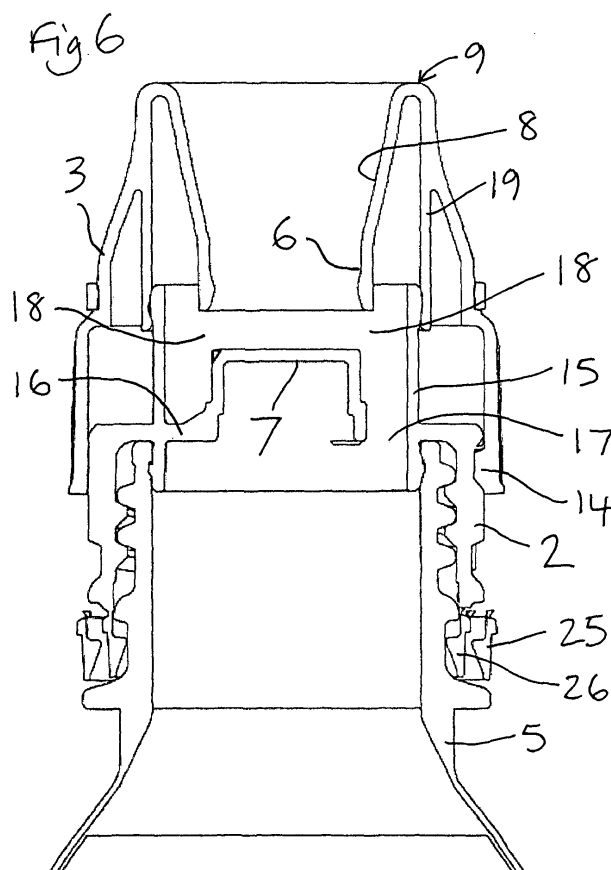
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(54) **Closure for a container**

(57) A sports closure (1) for a container (5) has a dispensing opening (9) adapted to be put into the mouth of a user and a valve (6,7) for the control of drink through the closure. The valve can be moved from a closed to an

open position with a single manual movement and the area of the passage (6) for flow through the valve is sufficiently large to permit free pouring of carbonated drinks through the valve.



Description

[0001] The application relates to a type of closure known as a sports closure. Such closures are known for use on containers for sports drinks. Typically, the closure contains a valve which can be opened in a single manual action. When the valve is opened, drink can be drawn through the closure either by sucking on the closure or squeezing the container or both. No part of the closure is removed from the container and the valve is simply closed after use, ready for re-use at a later time.

[0002] Such closures are acceptable for water or non-carbonated drinks but are not suitable for use with carbonated drinks where the pressure in the container may be about four times atmospheric pressure. Typical sports closures would be forced open by such internal pressures. Further, the cross-sectional area of the flow passages through typical sports closures is so small that if the containers are inverted with the valve open, liquid will not flow out. Such closures, if used with carbonated drinks would lead to highly undesirable frothing at the mouth piece as well as shearing of the drink which affects the flavour.

[0003] Bottles for carbonated drinks typically have a screw cap which must be rotated through nearly 540° for removal. Since the most rotation which can comfortably be achieved in one manual movement is about 180°, this amounts to three manual movements or more. The reason for this is to allow venting of pressure during the first two manual movements. This prevents the possibility of the cap being projected from the container by the pressure within. After opening, the cap must be put down or held before being replaced on the container.

[0004] There is therefore a need for a sports closure which can resist high pressures in the container, which can be opened with a single manual movement and which has a flow passage of sufficient area to allow the drink to be poured freely through the closure.

[0005] Accordingly, the invention provides a sports closure for a container, the closure having a dispensing opening adapted to be put into the mouth of a user and a valve for the control of drink through the closure, wherein the valve can be moved from a closed to an open position with a single manual movement and wherein the area of the passage for flow through the valve is sufficiently large to permit free pouring of carbonated drinks through the valve.

[0006] Embodiments of the invention are described below with reference to the accompanying drawings, in which:

Figure 1 is a side view of the closure prior to first use; Figure 2 is a vertical section through the closure of Figure 1;

Figure 3 is a side view of the closure of Figure 1 in the closed position after first use and with the cap removed;

Figure 4 is a vertical section through the closure of

Figure 3;

Figure 5 is a side view of the closure in the open position;

Figure 6 is a vertical section through the closure of Figure 5;

Figure 7 is a first side view of the inner sleeve of the closure;

Figure 8 is a second side view of the inner sleeve taken at 90° to the first side view; and

Figure 9 is a vertical section through the outer sleeve of the closure.

[0007] The closure 1 shown in Figures 1-6 comprises an inner sleeve 2, an outer sleeve 3 and a cap 4. The inner sleeve is shown fitted to the neck of a container 5 by a screw thread arrangement as is well known. Alternatively, the inner sleeve may be snap-fitted to a container neck. The container may, for example, be a PET or other plastic bottle or a metal bottle. The outer sleeve 3 is held captive on the inner sleeve for limited axial movement thereon between a lower position, shown in Figures 1-4, and an upper position, shown in Figures 5 and 6. The cap 4 is fitted over the outer sleeve 3 and can be removed, leaving a tamper indicating ring 44.

[0008] A valve for the control of drink through the closure is formed in the closure by a cylindrical bore 6 formed on the outer sleeve and a cylindrical plug 7 formed on the inner sleeve. In the lower position of the outer sleeve, the plug 7 is sealingly located in the bore 6 to close the valve. In the upper position of the outer sleeve, the plug 7 is removed from the bore such that drink can pass through the bore 6. The bore 6 leads to a frustoconical bore 8 which expands upwardly to a dispensing opening 9 which is intended to be put to the mouth of the user.

[0009] The outer sleeve 3 is moved axially on the inner sleeve 2 by relative rotation of the sleeves. To this end, the outer sleeve is formed on its outer surface with a cam track 10 best seen in Figures 7 and 8. The cam track 10 is generally helical, having a main helical portion 11, but also has short circumferential portions 12 and 13 at its respective ends. The outer sleeve 3 is formed with a cam follower 14 on its inner surface which is held captive in the cam track 10. When the cam follower 14 is located in one of the circumferential portions 12, 13, the outer sleeve is locked against axial movement on the inner sleeve and the outer sleeve must be rotated such that the cam follower 14 moves out of the circumferential portions of the cam track 10 before axial movement can take place. This is particularly important when the outer sleeve is in its lower position with the valve closed; the valve then being effectively locked against the action of high pressures in the container. Nibs 100 are formed at the start and finish of the helical portion 11 of the cam track. These provide a tactile and audible feedback to the user.

[0010] Movement of the outer sleeve 3 between its lower and upper positions on the inner sleeve to open the valve is accomplished by a single manual movement. In particular, it is accomplished by rotation of the outer

sleeve 3 on the inner sleeve through less than 180°, preferably about 150°.

[0011] In order to permit carbonated drinks to be poured freely through the valve without undue frothing, the flow area of the passage in the cylindrical bore 6 should be at least 75mm² and may be as much as 115mm². The inner sleeve 2 is formed with a cylindrical bore 15 which is sealingly fitted, in use, to the inner surface of the neck of the container 5. The plug 7 is supported coaxially within the bore 15 by radial bridges 16. A passage 17 for liquid is formed between the radial bridges 16 and has an area at least as great as the area of the passage in the bore 6.

[0012] The gap between the lower edge of the bore 6 and the top edge of the plug 7 when the valve is fully open defines a frustoconical opening 18 for the flow of drink into the bore 6. The flow area of the frustoconical opening should be at least as great as the flow area of the passage in the cylindrical bore. Preferably, the three flow areas defined by the passage 17 between the bridges, the opening 18 between the bore 6 and the plug 7, and the bore 6 are substantially equal. This promotes free flow through the valve.

[0013] The cylindrical bore 15 also slides within a cylindrical wall 19 formed on the outer sleeve to provide a sliding seal which prevents the passage of liquid through the closure other than through the dispensing opening 9.

[0014] The upper end of the frustoconical bore 8 is connected to an outer wall 20 of the outer sleeve through an annular rim 21 which defines the dispensing opening.

[0015] The dispensing opening is adapted to be put to the mouth of a user without a seal being formed, so that drink can be poured through the valve and into the user's mouth.

[0016] A tamper indicating ring 25 i.e. fitted to the bottom of the outer sleeve 3. this is separated from the outer sleeve when the closure is first opened. A tamper indicating ring 26 is fitted to the bottom of the inner sleeve 2. This is separated from the inner sleeve if the closure is removed, or partially removed, from the container.

Claims

1. A sports closure for a container, the closure having a dispensing opening adapted to be put into the mouth of a user and a valve for the control of drink through the closure, wherein the closure can be moved from a closed to an open position of the valve with a single manual movement and wherein the area of the passage for flow through the valve is sufficiently large to permit free pouring of carbonated drinks through the valve.
2. A closure as claimed in claim 1, wherein the closure comprises an inner sleeve adapted to fit onto the neck of the container and an outer sleeve mounted on the inner sleeve for limited axial movement there-

on between lower and upper positions; wherein the valve for the control of the flow of drink through the closure is formed in the closure by a cylindrical bore formed on the outer sleeve and leading to the dispensing opening and a cylindrical plug formed on the inner sleeve; and wherein in the lower position of the outer sleeve the plug is sealingly located in the bore to close the valve and in the upper position of the outer sleeve the plug is removed from the bore such that drink can pass through the bore to the dispensing opening.

3. A closure as claimed in claim 2, wherein the outer sleeve is moved axially on the inner sleeve by relative rotation of the sleeves; the inner sleeve being formed on its outer surface with a cam track and the inner sleeve being formed with a cam follower held captive in the cam track; the arrangement being such that operation of the valve between the closed and open positions is accomplished by rotation of the outer sleeve on the inner sleeve through less than 180°.
4. A closure as claimed in claim 3, wherein the operation of the valve between the closed and open positions is accomplished by rotation of the outer sleeve on the inner sleeve through about 150°.
5. A closure as claimed in any one of claims 2 to 4, wherein a sliding seal is provided between the inner and outer sleeves to prevent the passage of liquid through the closure other than through the dispensing opening.
6. A closure as claimed in claim 2, wherein the inner sleeve is formed with a cylindrical bore sealingly fitted at its lower end, in use, to the inner surface of the neck of the container; wherein the plug is supported coaxially within the cylindrical bore of the inner sleeve by radial bridges; a passage for liquid being formed between the radial bridges; the area of the passage being at least as great as the area of the passage in the cylindrical bore of the valve.
7. A closure as claimed in any preceding claim, wherein the area of the passage in the cylindrical bore of the valve is at least 75mm².
8. A closure as claimed in any one of claims 2 - 7, wherein the cylindrical bore of the valve leads to a frustoconical bore which expands upwardly to the dispensing opening.
9. A closure as claimed in claim 8, wherein the upper end of the frustoconical bore is connected to an outer wall of the outer sleeve through an annular rim which defines the dispensing opening.
10. A closure as claimed in claim 2, wherein the cam

track is generally helical with a short circumferential portion at each end.

11. A closure as claimed in any preceding claim wherein the closure is provided with a removable cap covering the dispensing opening. 5

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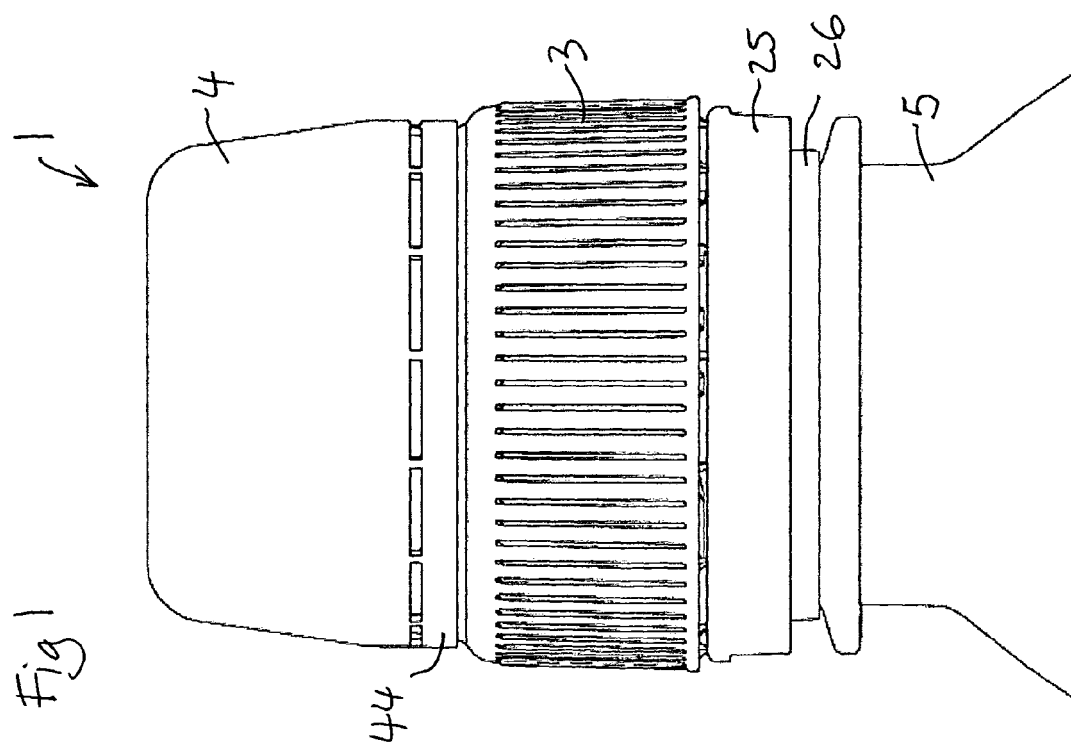
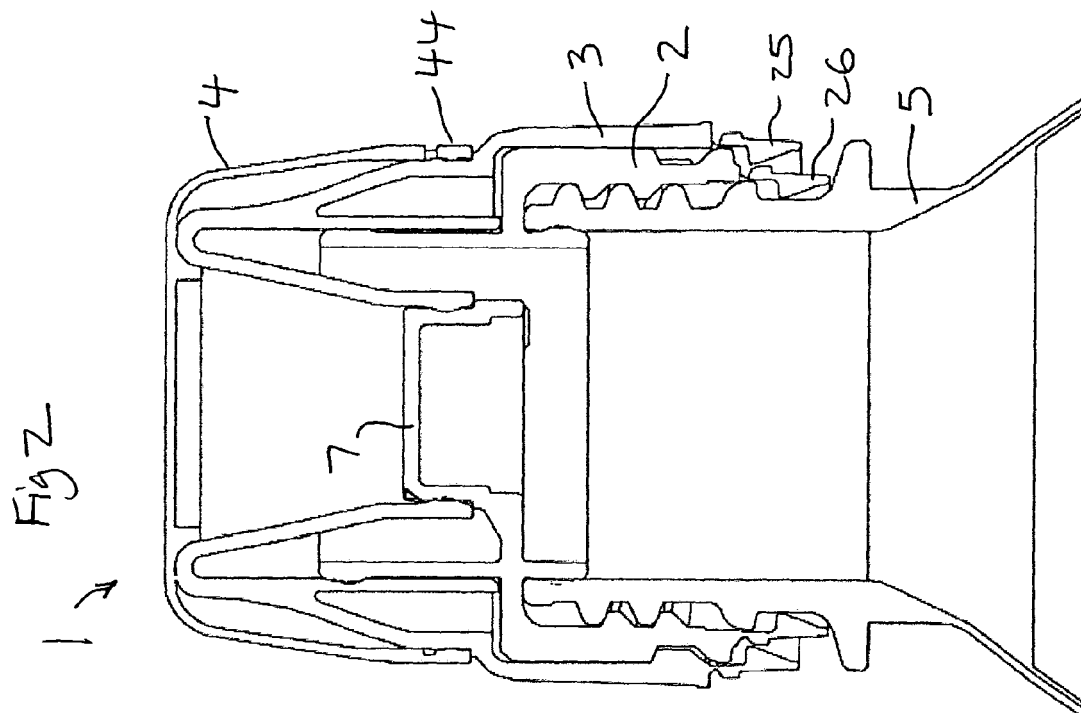
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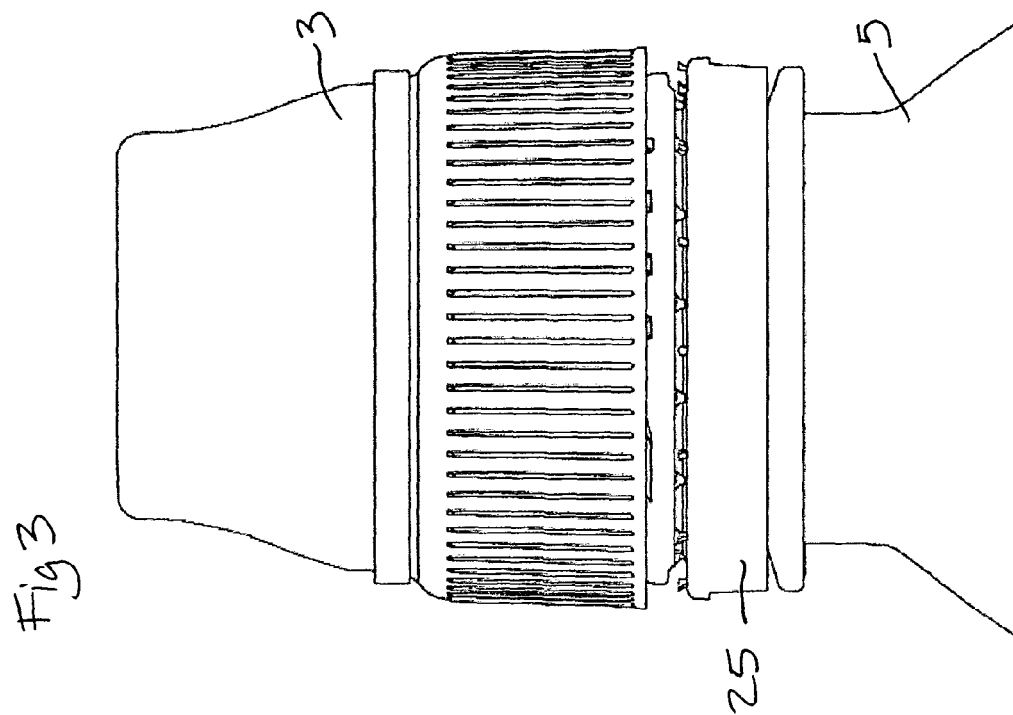
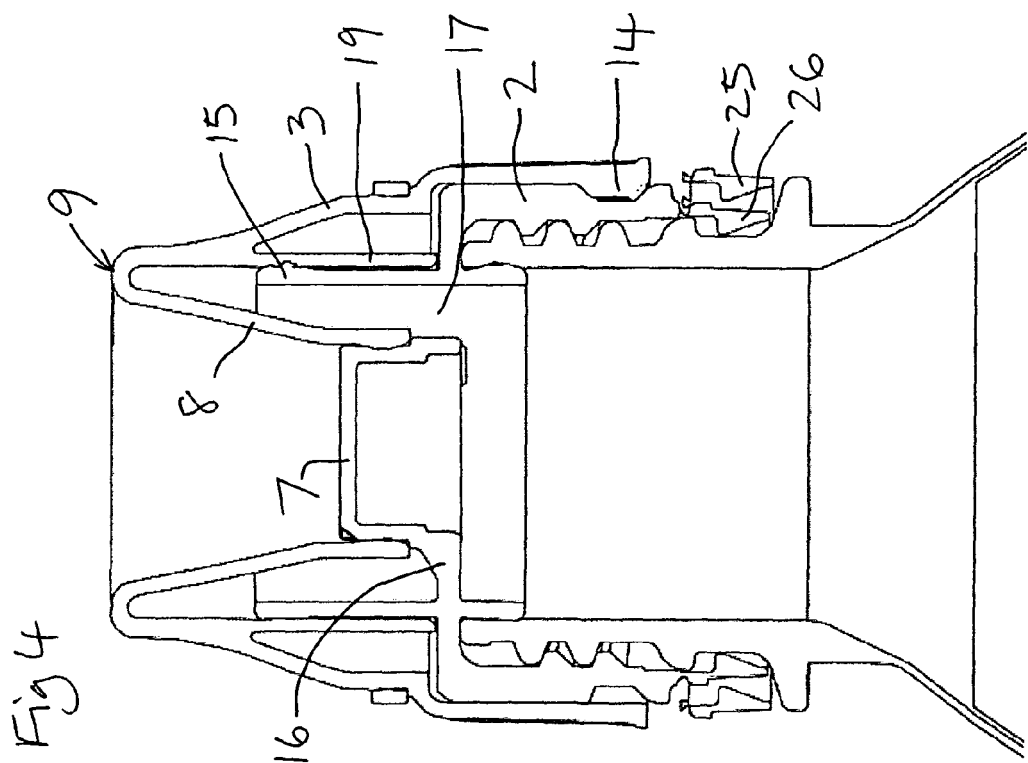
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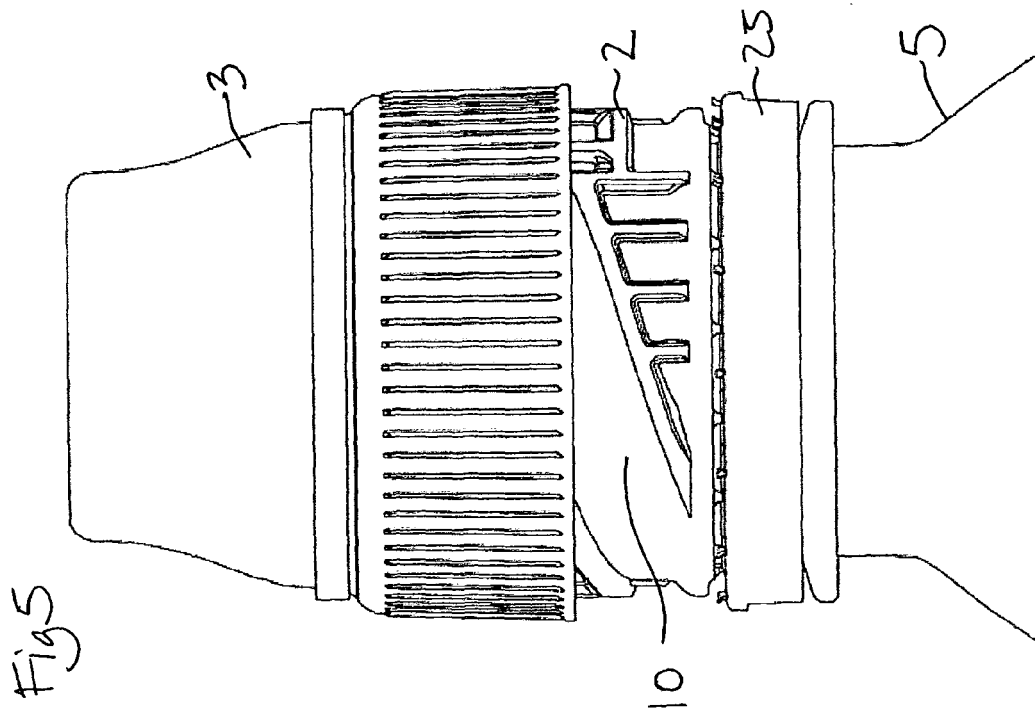
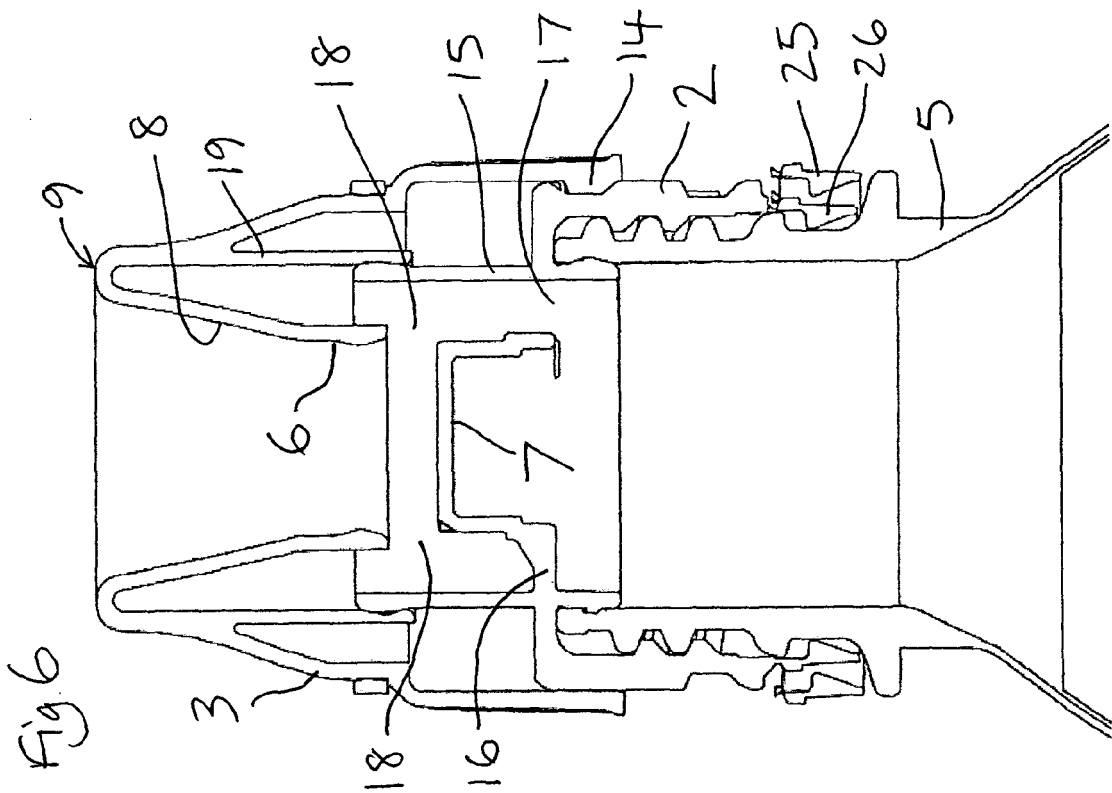


Fig 8

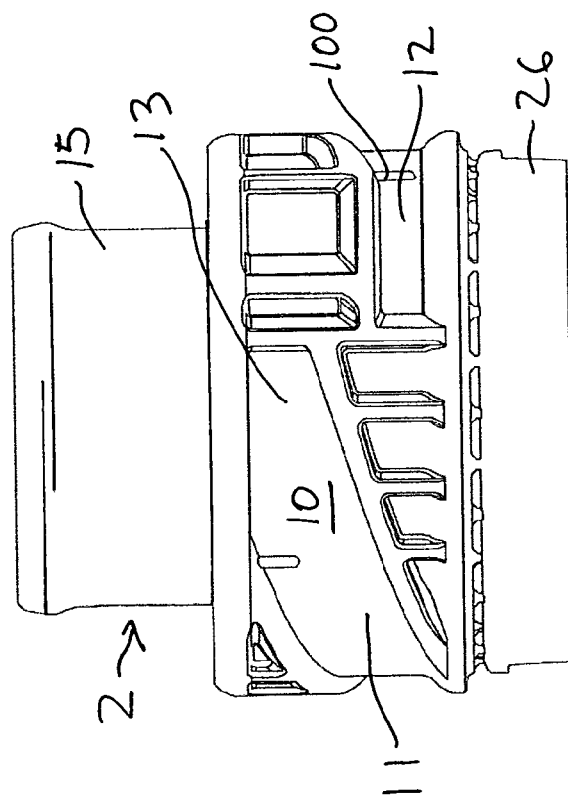
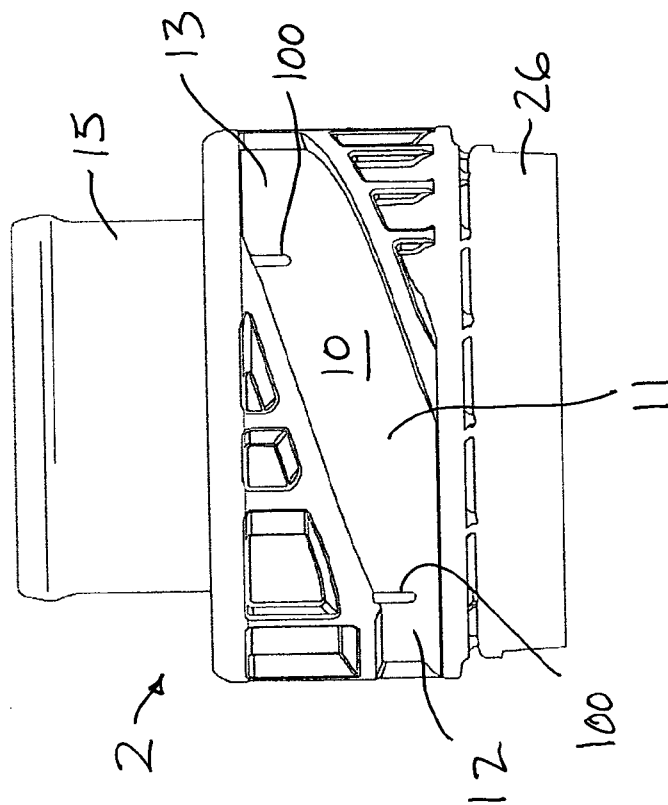
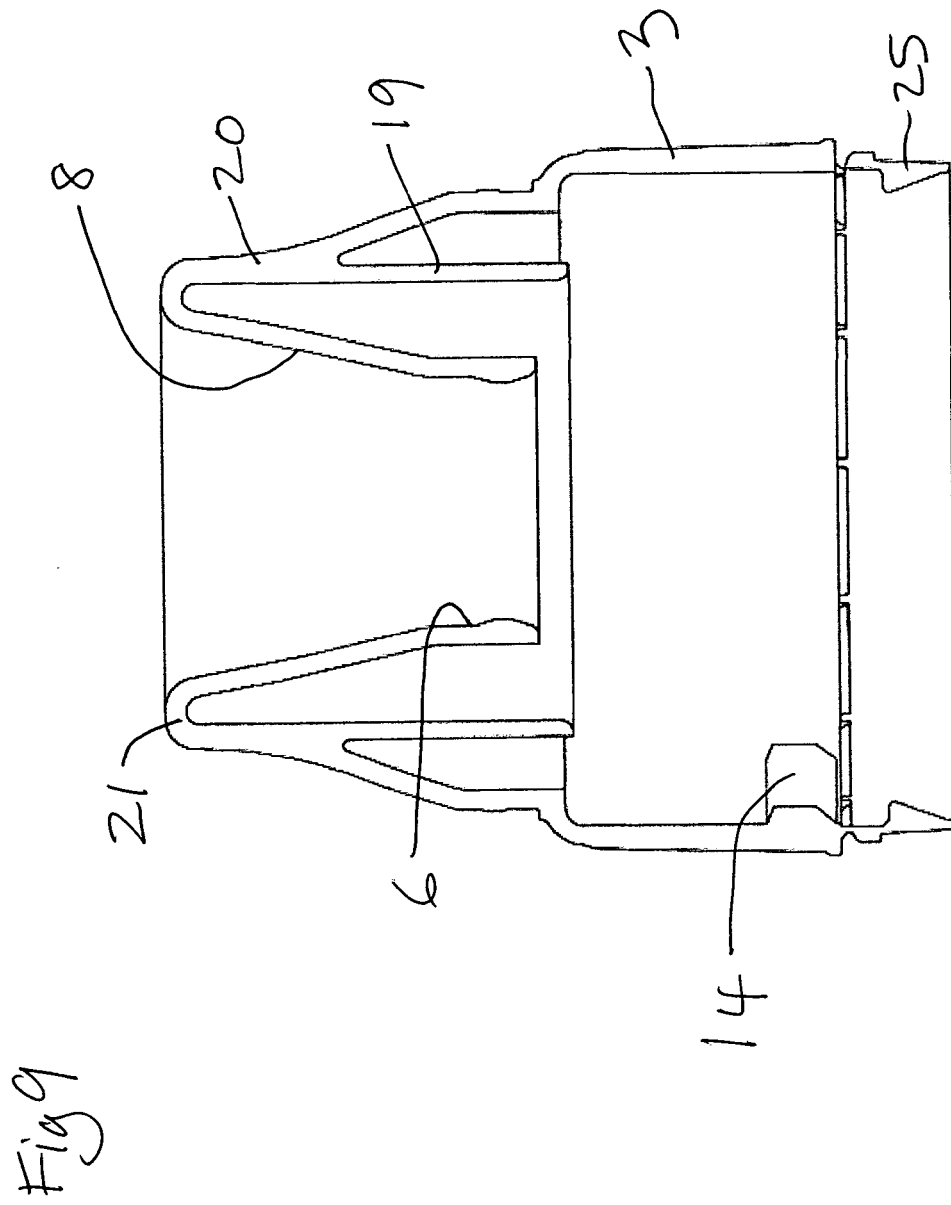


Fig 7







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X	US 2005/139621 A1 (FOSTER DAVID E) 30 June 2005 (2005-06-30)	1-5,10,11	B65D47/24
Y	* paragraphs [0006], [0072] - [0098] * * figures 1,2 *	8,9	
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Y	* paragraphs [0008] - [0020] * * figures 1-4 *	8,9	
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X	FR 2 663 300 A (MOREL SIMONE) 20 December 1991 (1991-12-20)	1	TECHNICAL FIELDS SEARCHED (IPC)
Y	* page 2, line 25 - page 5, line 12 * * figures 1-3 *	8,9	
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 15 December 2005	Examiner Fitterer, J
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			

**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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