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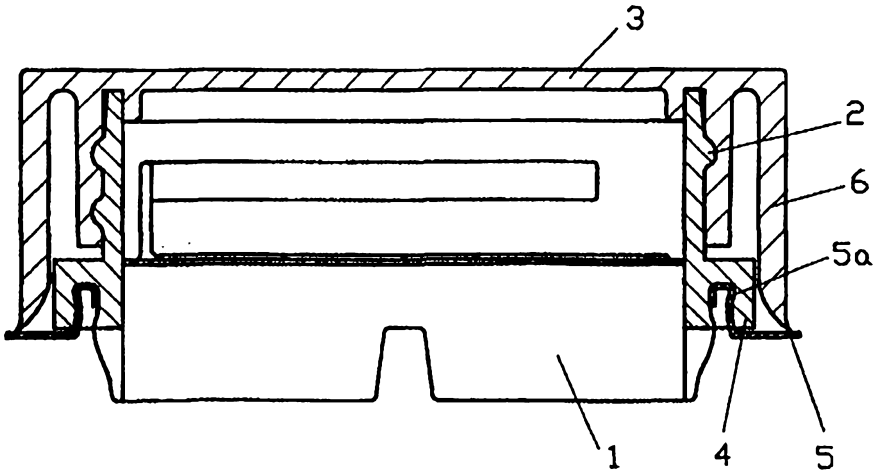

(57) Abstract

The invention relates to a device for closing a container (5) with a pipe-shaped neck (1) which can be fastened or is fastened to said container (5). The top end of said neck is provided with a screw thread (2), and with a cover (3) screwable thereon. The cover (3) has a diameter region which is larger than the diameter of the neck (1) and is provided with a surrounding sealing tab (6). The device prevents the filling material from diffusing out and enables the emptying process to be simple and complete.

(57) Zusammenfassung

Vorrichtung zum Verschließen eines Behälters (5) mit einem an dem Behälter (5) befestigten oder befestigbaren stutzenförmigen Hals (1), der an seinem oberen Ende mit einem Schraubgewinde (2) versehen ist, und mit einem darauf aufschraubbaren Deckel (3), wobei der Deckel (3) mit einem Durchmesserbereich, der größer als der Durchmesser des Halses (1) ist, umlaufend mit einer Dichtlasche (6) versehen ist. Die Vorrichtung verhindert ein Ausdiffundieren von Füllgut und ermöglicht ein leichtes und vollständiges Entleeren.

Abstract

Device for closing a container (5) with a nozzle-shaped neck (1) which is or can be fastened on the container (5) and is provided with a screw thread (2) at its upper end and with a lid (3) which can be screwed thereon, wherein the lid (3) with a diameter range which is greater than the diameter of the neck (1) is provided with a peripheral sealing tab (6). The device prevents out-diffusion of filling and allows easy and complete emptying.

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Device for closing containers

The invention relates to a device for closing containers or vessels such as cans or tins, for example for lacquers, which allows these containers to be sealed tightly.

A wide variety of closures is known for closing containers. In particular, screw caps are normally used. Screw caps equipped with a press-in seal are increasingly being used, for example, for lacquer tins.

Furthermore, child-proof closures are used for vessels in which solid or liquid products, for example cleaning agents or hazardous liquids, are stored. These can be of various designs. Closures are known, for example, in which the vessel to be sealed has a thread at the orifice, beneath which there are two recesses. The lid which can be screwed onto this thread contains two extensions which engage in the recess on closure. The closure lid can only be opened by lateral pressure in the lid region.

In addition to child-proofing, it may also be necessary to allow the vessels to be completely emptied and protected from leakage. Vessels of this type are equipped, for example, with an outlet nozzle or nozzle-shaped neck which can be designed with varying degrees of flexibility (G 92 06 318.7, DE 43 29 036). To guarantee that these closures are child-proof, the neck and lid can have detachably engaging teeth. To open the lid, the teeth first have to be released by pressing specific flexible zones of the neck or specific pressure points. The container can only be opened after release of the teeth.

The above-mentioned closures can have the drawback that, despite the relatively tight fastening of the closure on the container, diffusion of filling components from the container through the closure cannot be completely avoided.

This occurs, in particular, in the case of closures which have relatively thin flexible walls. Filling components can diffuse through them into the environment and, under certain circumstances, can change the composition of the material in the container and damage health with diffused solvent vapour.

The object of the present invention is to provide a device for closing a container, in particular a container containing a liquid such as a coating medium, for example lacquer, which prevents undesirable diffusion of filling components from the container into the environment. This device should also allow easy, complete emptying of the container.

It has been found that this object is achieved by the device forming a subject of the invention for closing a container with a nozzle-shaped neck which is or can be fastened on the container and is provided with a screw thread at its upper end and with a lid which can be screwed thereon, which is characterised in that the lid with a diameter range which is greater than the diameter of the nozzle-shaped neck is provided with a peripheral sealing tab.

According to a preferred development, the device according to the invention can be designed so that, when the lid is screwed home, the sealing tab rests on the upper face of the container, on a projection formed on the upper face of the container and/or on the part of the neck in contact with the upper face of the container or the projection formed thereon.

The device according to the invention therefore consists of a lower part in the form of a nozzle-shaped neck for fastening on a container orifice and a lid (screw lid, screw cap) which can be screwed thereon, the rim of the lid being equipped, for example, with a peripheral sealing tab. The sealing tab, in its length, can contact the upper face of

the container or can rest thereon; it can also be applied without contacting the upper face of the container. The diameter of the screw lid equipped with the peripheral sealing tab projects beyond the diameter of the neck located on the container orifice.

It is advantageous if the peripheral sealing tab according to the invention, for example, at the outer region of the lid, in its length, is guided downwards in the direction of the upper face of the container such that it rests peripherally on the outer rim of the container orifice without contacting the upper face of the container. For this purpose, the normally horizontally or conically extending upper face of the container can be provided, in the region of the container orifice, with a projection, for example a step, which forms, for example, the outer rim of the container orifice.

The lower part of the peripheral sealing tab can be designed in various ways, for example it can have narrowing in its shape, for example furrows or bevels.

The peripheral sealing tab on the screw lid according to the invention can also be so designed that it peripherally contacts the upper face of the container and is supported thereon. In the case of a small supporting face, the sealing tab, with its outer edge, is guided down to the upper face of the container such that it just contacts it. If the sealing tab has a greater supporting face, it can be guided so far down to the upper face of the container, for example, that it is bent inward or outward and is supported on the upper face when the lid is screwed on, as viewed from the rim of the lid. The sealing tab can be flexible in design for this purpose. The sealing tab can also be shaped, in its lower portion, as a double tab, one edge of which contacts the upper face of the container inwardly when the lid is screwed on or rests on the upper face of the container while the second edge is directed outwards.

The peripheral sealing tab can be arranged on the outer rim of the lid if the diameter of the lid is extended. The extension can be arranged in the same plane as the upper rim of the lid. It can also be bevelled or designed with an offset from the upper lid rim. When the closure according to the invention is pressed onto the container orifice, it allows the lid to spring back in its outer region and therefore creates less mechanical stress in the sealing tab when the closure is pressed on. Furthermore, a grip for better handling of the lid can be worked in the upper region of the sealing tab at the level of the upper lid rim.

The sealing tab applied according to the invention can be used for upper faces which extend horizontally and are also bevelled, for example extend conically downwards or upwards, or are bevelled, of containers.

The requirement for child-proofing of closures for containers which contain hazardous substances such as lacquer can be fulfilled by the sealing tab used according to the invention. In the lower portion of the sealing tab, for example, there can be provided internal axial sets of teeth which are arranged in the interior of the sealing tab either peripherally or at specific intervals, for example opposite one another, e.g. in the form of 2 to 5 teeth. Corresponding peripheral sets of teeth can then be located on the neck of the device according to the invention, for example in the portion directed toward the sealing tab. With this development, the peripheral sealing tab with the teeth arranged thereon moves over the peripheral teeth provided on the neck on closure of the lid. Once the lid is closed, the teeth of the sealing tab lie in the teeth of the neck. The child-proofing must be releasable in design for opening the lid. For example, the sealing tab can have unlocking systems for this purpose. For example, the sealing tab can be flexible in design so it can be pressed in. When the sealing tab is pressed in at the positions of the teeth, the teeth of the sealing tab can disengage from the peripheral teeth

on the lower part. The lid can then be unscrewed. The opening of the lid is therefore permitted only when the lid is moved simultaneously with disengagement of the child-proofing.

With the device according to the invention for closing a container, the nozzle-shaped neck can also be designed in the form of flexible bellows. In particular, the invention is also suitable for closures whose nozzle-shaped neck is designed as press-in bellows. This allows the neck to be collapsed and extended in the manner of bellows, for example in the orifice of the container. The bellows-like neck can be uniformly round in design. It is also possible to equip the bellows with different wall thicknesses. For example, the external form of the bellows can be annular while the internal form is elliptical.

The bellows can also be stabilised by one or more central ribs in the cross section of the bellows or by a peripheral rib on the internal wall of the bellows. Rib-shaped stabilisers of this type are known, for example from EP-A-0 641 724. It is also possible to use bellows with a peripheral rib on their external wall. The flexible design of the bellows-like neck provides a further opportunity for unlocking the above-described child-proofing, for example by lateral pressure on the neck.

The neck of the closure device according to the invention can be fastened on the container orifice in various ways. For example, the lower end of the neck can be so designed that it is pressed into the container orifice and, for example, caught therein. The design of the neck at the level of the container orifice is adapted to the rim of the container orifice which is bent outwardly in the form of a nozzle, for example, to form a projection, in such a way that the lower part of the closure is guaranteed a secure fit.

The neck of the closure can also be so designed that it can be pressed on in order to fasten it. The lower part of the neck can thus be, for example, cuff-shaped in design so it covers from above the rim of the container orifice comprising, for example, a projection. A development which only partially surrounds the rim of the container orifice is also possible.

When the rim of the container orifice is partially surrounded by the neck of the closure device according to the invention, the peripheral sealing tab at the lid rim according to the invention can additionally have catches on its interior toward the container rim. When the lid is screwed on, these catches engage beneath the partial surround and thus allow the sealing tab to rest closely on the upper face of the container. This design is preferred in closure devices with a bellows-like lower part.

With a bellows-like press-in neck, in particular, the sealing tab of the lid can be designed as a horizontal continuation of the upper lid rim so this continuation rests on the container orifice on a cuff-like design of the fastener of the neck when the lid is screwed on and the bellows pressed in.

Additional sealing devices of various designs can be used to enhance the sealing effect, in particular with closures having a bellows-like neck.

For example, the bellows-like neck can be shortened so that it is axially tensioned (bias) when the lid is screwed on and the bellows pressed in. The lid together with the peripheral sealing tab is thus pressed onto the portion of the bellows surrounding the container rim. This bias is permitted by shortening the upper edge of the bellows. The lid is initially only partially screwed on, and the bellows pressed in. As the lid is tightened, the bellows are expanded so the lid is pulled downwards onto the container.

The bellows preferably have flexible zones. A rigid connection is achieved between lid and overlapping portion of the bellows. The bellows can be shortened, for example, by 1 to 2 mm.

In a further variation, the lid which can be screwed onto the bellows-like neck can have a closure device on its underside outside the threaded region but within the sealing tabs applied according to the invention. These can be grooves projecting downwards, for example from the underside of the lid. The region of the neck covering the container orifice in turn contains, for example, indentations for receiving grooves in the lid. When the lid is screwed on and the bellows are pressed in, the grooves are pressed into these indentations and therefore produce a tight connection between lid and neck. The grooves in the lid can be arranged as desired in a regular sequence or irregularly. It is also possible to provide, instead of the grooves, a continuous rib which, when the bellows are pressed into a continuous indentation, engages in the end of a bellows-like neck surrounding the container rim.

In a further variation, the grooves or the continuous rib can be so arranged on the underside of the lid outside the lid thread but inside the sealing tab arranged according to the invention, that the grooves press the bellows in their lower portion against the container rim when the bellows are pressed in. A tight connection between lid and lower part can also be guaranteed in this way.

It is desirable if the sealing tab is flexible or elastic in design. The elasticity of the peripheral sealing tab can be guaranteed, for example, merely by the shaping of the tab.

The lid and neck of the closure device according to the invention can consist, for example, of any plastics materials. Material which is tight to permeation such as HDPE, LDPE or LLDPE is particularly preferred.

The sealing tab can preferably consist of resilient material. Close contact with the upper face of the container is therefore permitted. Damage to the upper face of the container is also thereby avoided when the device according to the invention is pressed onto the container rim.

The lid material preferably consists of HDPE and the neck of LDPE. Treatment of the material to improve the physical properties, for example rigidity, permeation tightness, of the lid material such as fluorination, sulphonation or metallisation is possible.

With a bellows-like design of the neck of the closure device according to the invention, the bellows can be rigid or elastic. Bellows which can be collapsed and extended are preferred. It is desirable if the bellows are formed from elastic material so a proportion of the deformation energy can be absorbed in the case of undesirable jerky mechanical stress. According to a particular development, the material is less flexible at the upper and lower end of the bellows than in the intervening central portion.

The closure device according to the invention is suitable for simple press-in closures and for press-in closures for barrels which can be completely emptied.

The developments according to the invention are easy to handle. The device can be so designed that brief pressure is sufficient to ensure engagement of the neck with the screwed on lid on or into the container rim. The sealing tab arranged according to the invention on the outer lid rim comes into effect in the manner described according to the invention.

In the case of the closure device according to the invention with a bellows-like neck, engagement of grooves or a rib which can be provided in the lid is permitted by application of light pressure. In the development with the shortened

bellows, the bellows are automatically pulled toward the container orifice when the bellows are pressed in.

The closure seal according to the invention avoids the risk of filling components such as steam or solvent vapours escaping into the environment. A change in the composition of the material in the container can therefore be avoided. Furthermore, damage to health by the solvent vapours diffusing into the environment of the container can be avoided.

In particular, known bellows-type closures can rise in the event of an increase in the internal pressure in the container (for example during a rise in temperature) or in the event of a reduction in external pressure (for example with inadequate pressure compensation in air freight traffic). With the closure seals according to the invention, the covering effect is maintained at ambient temperatures of up to 40°C insofar, in particular, as the bias compensates the possible vapour tension of liquids poured into the container.

Preferred embodiments of the closure device according to the invention are illustrated in the accompanying drawings.

Fig. 1 shows a closure according to the invention with a neck 1 provided with a screw thread 2 at its upper end. A screw lid 3 is placed thereon. The neck 1 is pressed into a curved orifice of a container 5. At the outer end of the lid 3 is a peripheral sealing tab 6 which, in the direction of the upper face of the container 5, fits closely on the rim of the orifice of the container 5 which is stepped in the form of a projection 5a.

Fig. 2 shows a closure according to the invention with neck 1 and screw lid 3, the neck 1 having a cuff-shaped fastening system 4 which is pressed over a projection 5a on the orifice of the container 5. At the outer end of the lid 3 is

a peripheral sealing tab 6 which is bevelled at the bottom, extends to the upper face of the container 5 and places itself externally thereon.

Fig. 3 shows a device according to the invention in the form of a screw cap press-in closure with a bevelled region at the outer rim of the lid 3 from which the peripheral sealing tab 6 extends to the upper face of the container 5.

Fig. 4 shows a device according to the invention in the form of a screw cap press-in closure in which the peripheral sealing tab 6 rests on a conically shaped upper face of the container 5.

Fig. 5 shows a device according to the invention in the form of a screw cap press-in closure with a peripheral sealing tab 6 which is split in its lower portion and provided with a furrow, forming an internal sealing edge 7 and an external sealing edge 8.

Fig. 6 shows a device according to the invention in the form of a screw cap press-in closure additionally containing child-proofing. On the peripheral sealing tab 6 at the level of the cuff 4 is an inwardly directed set of teeth 9 with, for example, 2 to 5 teeth. This set of teeth is also arranged on the opposite side of the peripheral sealing tab 6. The cuff 4 of the neck also comprises a set of teeth 10 which is located peripherally on the external portion of the cuff 4. When the lid 3 is screwed on, the sealing tab 6 with the set of teeth 9 slides over the set of teeth 10 of the cuff 4 of the lower part until the closing process is completed. 9 and 10 then mesh.

Fig. 7 shows a device according to the invention in the form of a screw cap press-in closure with a pressed-in bellows-like lower part 11 provided with a screw thread 2 at its upper end. The screw lid 3 is located thereon. A shoulder which can be used as a grip 12 is located on the outermost

rim of the screw lid 3 in the direction of the sealing tab 6. The sealing tab 6 is directed outwardly and rests on the upper face of the container 5.

Fig. 8 shows a closure according to the invention with pressed-in bellows 11 of which the lid 3 has catches 13 on the peripheral sealing tab 6 at the level of the cuff-like fastening system 4. The cuff-like fastening system 4 only partially surrounds the rim of the container 5 so the catches 13 of the sealing tab 6 can engage beneath the cuff-like fastening system 4 when the closure device is pressed on.

Fig. 9 and 10 show a closure with pressed-in bellows which has bellows 14 shortened by x in Fig. 9 to increase the closing effect, creating a bias. The screw lid 3 is thus pressed onto the cuff-like fastening system 4 resting on the rim of the container 5. Fig. 10 shows, on the underside of the lid 3, a peripheral rib 15 which presses the bellows 11 at the level of the cuff-like fastening system 4 against the rim of the container 5. In Fig. 9 and 10, the upper rim of the lid 3 is lengthened horizontally to form a sealing tab 6 which rests on the cuff-like fastening system 4 of the bellows.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A device for closing a container with a nozzle-shaped neck which is or can be fastened on the container and is provided with a screw thread at its upper end and with a lid which can be screwed thereon, characterised in that the lid with a diameter range which is greater than the diameter of the neck is provided with a peripheral sealing tab.

2. A device according to claim 1, characterised in that the sealing tab is so designed that, when the lid is screwed home, the sealing tab rests on an upper face of the container on a projection formed on the upper face of the container and/or on a portion of the neck in contact with the upper face of the container or the projection formed thereon.

3. A device according to claim 2, characterised in that the projection is so designed that it forms the rim of an orifice to be sealed, in the upper face of the container.

4. A device according to any one of claims 1 to 3, characterised in that the sealing tab is so designed that it rests on the upper face of the container and has furrows or is bevelled on its lower supported portion.

5. A device according to any one of claims 1 to 4, characterised in that the sealing tab is flexible in design.

6. A device according to any one of claims 1 to 5, characterised in that said device has child-proofing.

7. A device according to claim 6, characterised in that the child-proofing is designed in the form of teeth on the interior of the sealing tab which engage releasably in teeth on the outer periphery of the neck.

8. A device according to any one of the preceding claims, characterised in that the nozzle-shaped neck is flexible in design or is provided with flexible zones.

9. A device according to claim 8, characterised in that the neck is designed in the form of a bellows which can be pressed into the container orifice.

10. A device according to any one of the preceding claims, characterised in that, between the screw thread of the lid and its sealing tab, said device has one or more

closure devices which engage in the fastening system of the neck at the upper face of the container when the lid is applied.

11. A device substantially as hereinbefore described with reference to the accompanying drawings.

DATED: 16 November 1999

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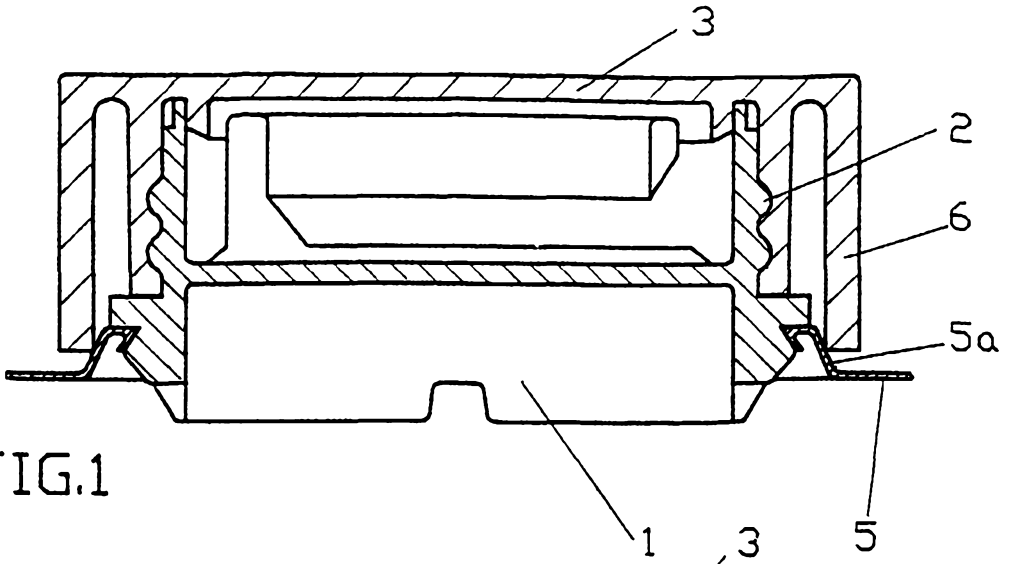

FIG.1

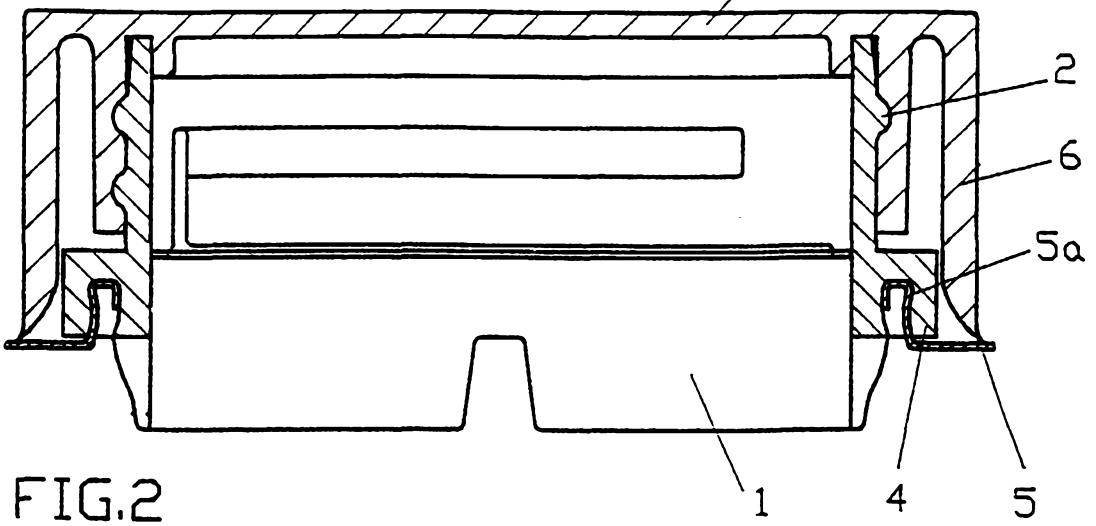

FIG.2

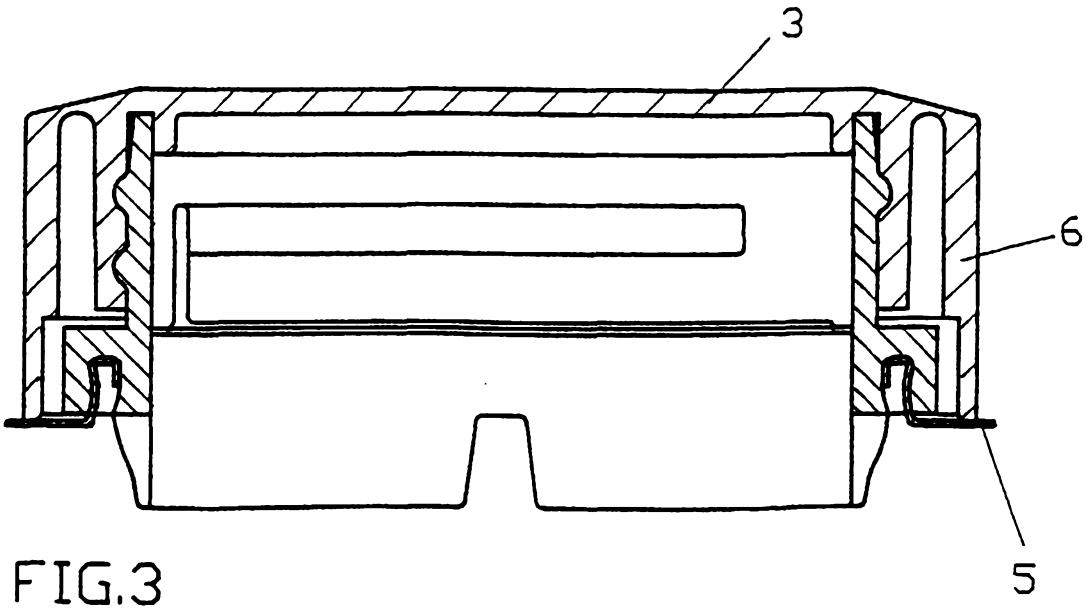

FIG.3

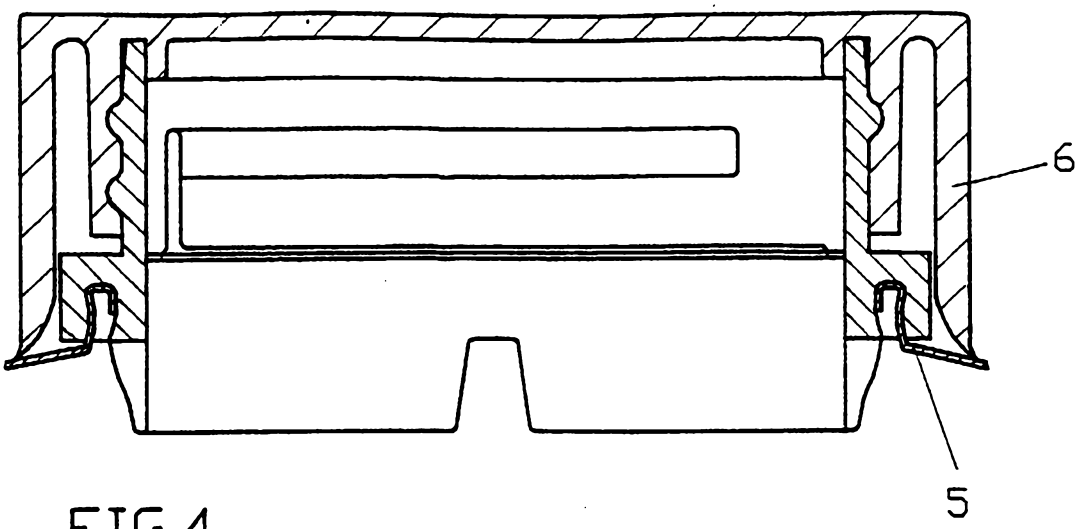

FIG.4

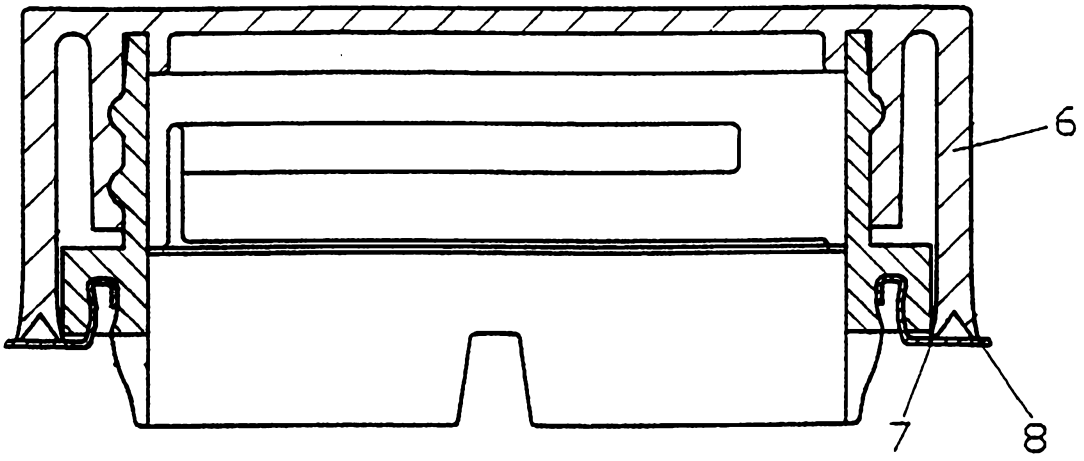

FIG.5

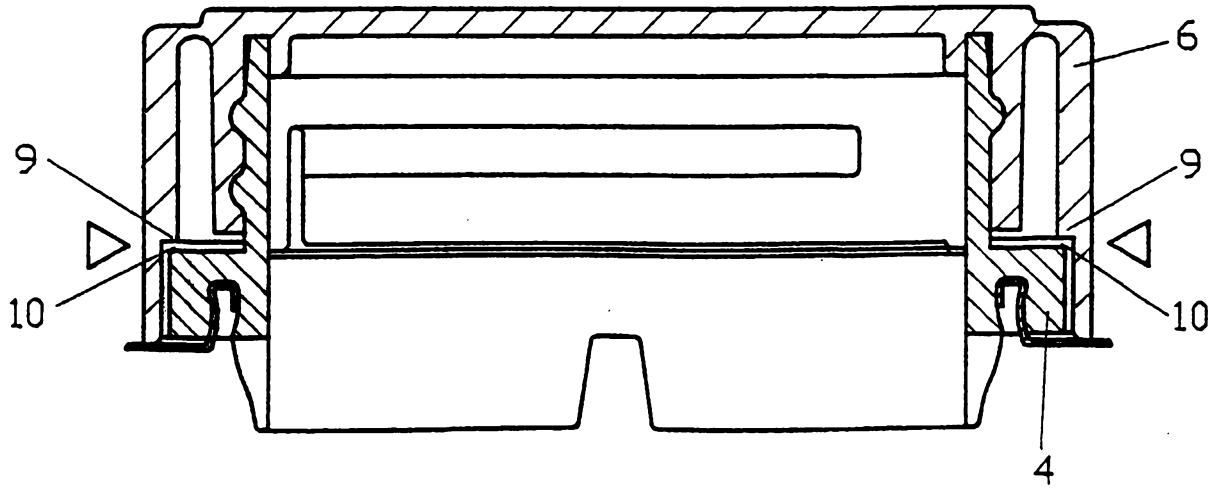

FIG.6

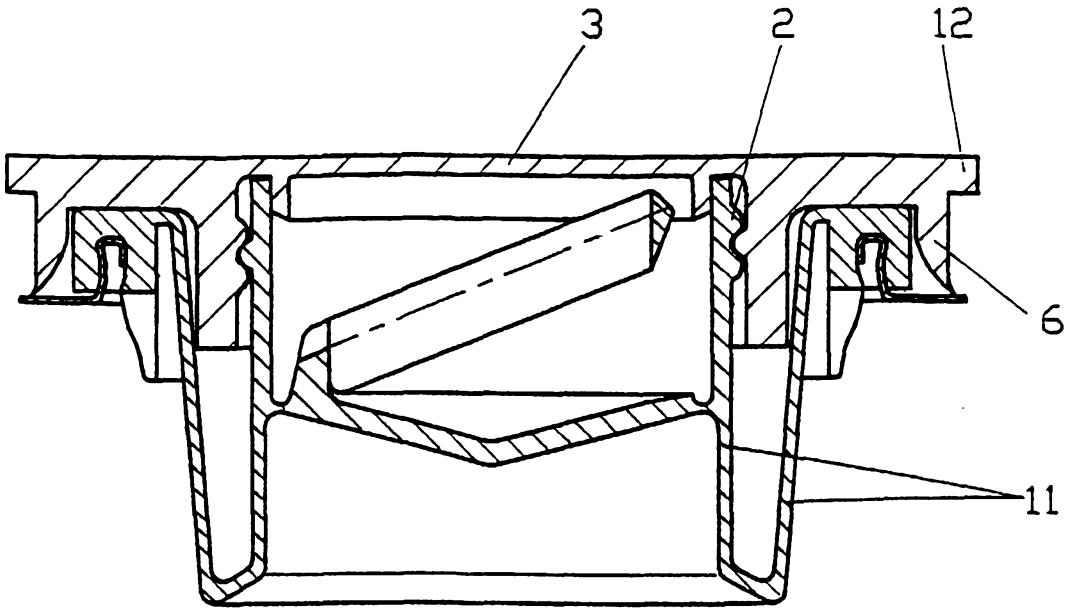

FIG.7

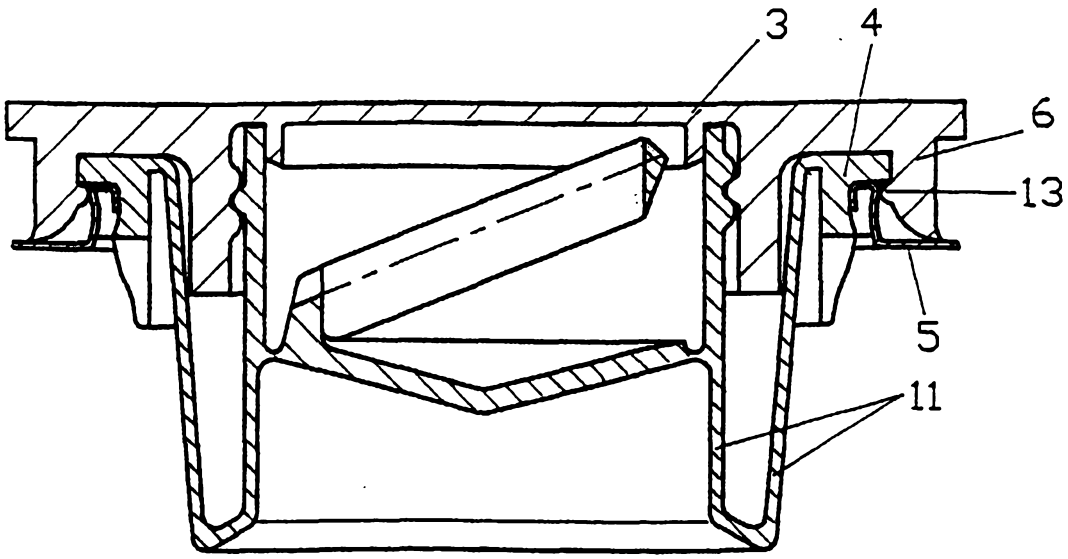

FIG.8

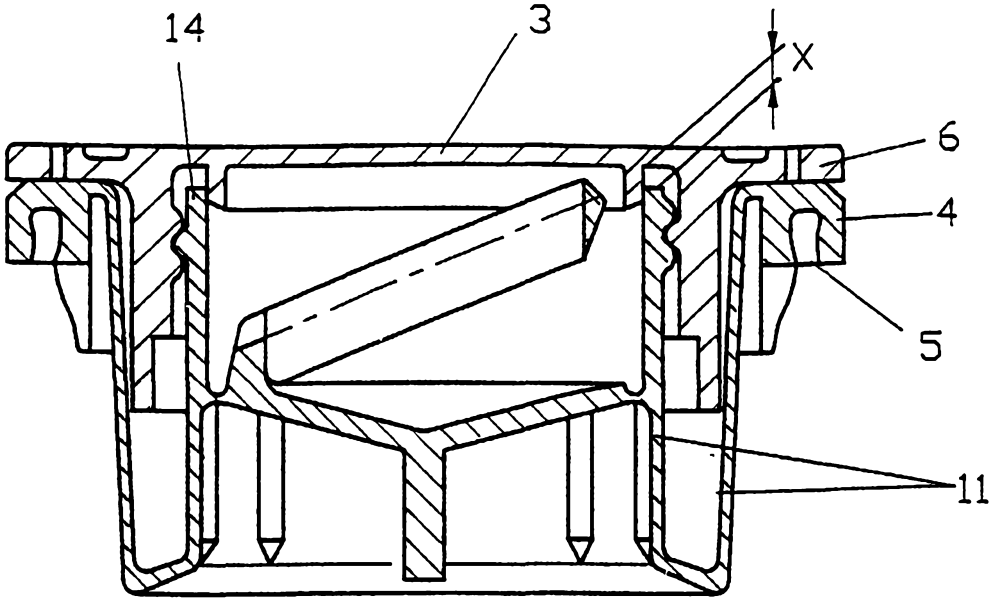

FIG.9

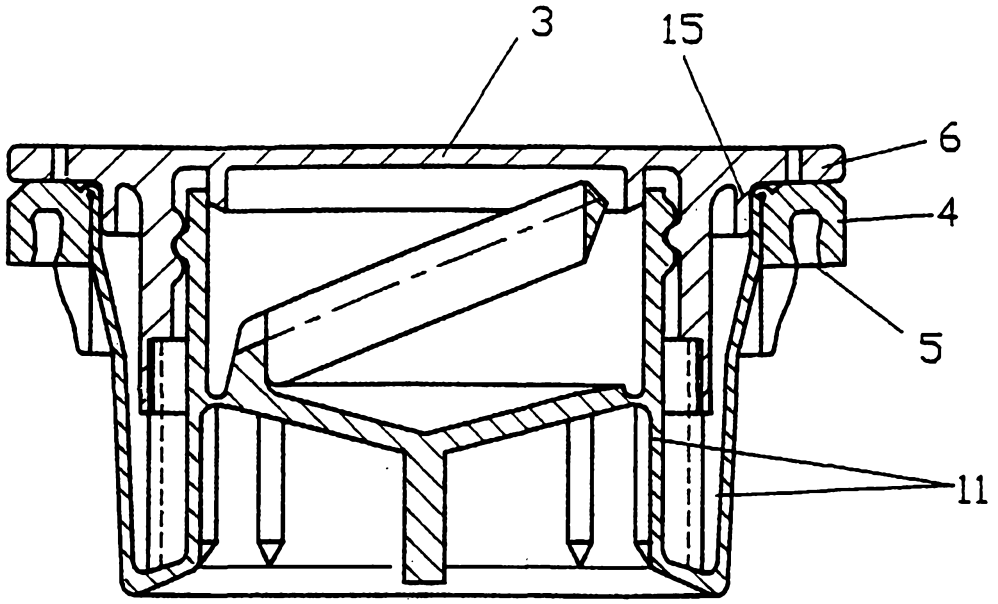

FIG.10