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(54) A dispenser.

(57) A dispenser for liquid material, such as shoe polish comprising a container (1) and an applicator (2) by means of which small quantities of material can be removed from the container by dipping, and applied to a surface to be treated. The container comprises a space (12) containing liquid material and an adjacent space (14) for receiving the applicator (2). The material-containing space (12) is closed at the upper end and communicates with the adjacent applicator-receiving space (14) exclusively through a passage (13) at the lower end. The passage (13) can be unobstructed so that liquid transfer from the liquid-containing space (12) to the adjacent space (14) is automatically controlled by the physical, so-called Torricelli-tube principle. Additionally, check valve means (23-25) or water-seal means (28-33) can be provided in the bottom part of the container.

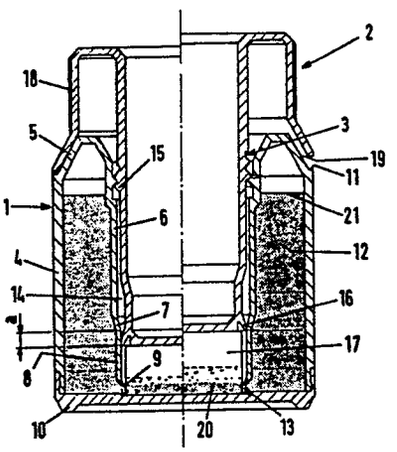

FIG.1

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A dispenser

This invention relates to a dispenser for liquid material, such as shoe polish, comprising a container and an applicator by means of which a small quantity of the material can be removed from the container by dipping, and applied to a surface to be treated with the material.

Although the present invention can be applied in many fields, e.g. also in the field of cosmetics, it will be described herein with particular reference to its application as a shoe polish dispenser.

A drawback of shoe polish dispensers of the above described type is that after some time drying out of the applicator will occur due to evaporation. Another drawback is that it is difficult when dipping a material-receiving end of an applicator into a mass of liquid material, to always absorb a controlled small amount of the material, such as a small amount of shoe polish for spreading it on a shoe surface.

It is an object of the present invention to provide a dispenser, in particular for shoe polish, wherein the above drawbacks are avoided, and which can be made at an acceptable cost price.

To that end, in the dispenser according to the present invention, the container is constructed as a space closed at the top, which communicates exclusively through a passage at its bottom with an adjoining space which is closable by the applicator.

Based on the Torricelli-tube principle, the container always dispenses so much liquid through the passage to the adjoining space that a hydrostatic equilibrium condition is reached with a low liquid level in the adjoining space and a much higher level in the container, wherein a subatmospheric pressure prevails above the liquid. Each time when so much liquid has been removed from the adjoining space by the applicator that air can flow into the container, liquid is replenished from the container to the original, low level. This means that when the applicator is inserted into the space adjoining the container to a given depth, e.g. defined by a stop, the material-receiving end thereof is always dipped into the liquid equally deeply, and hence each time the same amount of material is withdrawn from the stock.

In a practical embodiment of this principle according to the invention, the container is constructed as an annular space bounded by an outer wall and an inner wall and closed at the top, which annular space communicates through a passage near a continuous bottom with a central cavity closable by an applicator having at its lower end an end portion receiving material through absorption, in particular a sponge having substantially the same diameter as the central cavity, in such a manner that when the container is closed the sponge is in contact with the container bottom.

A dispenser of this type can be manufactured with a loose bottom plate at low cost, e.g. by injection molding. After combining the applicator and the container without the bottom, the dispenser can be filled in the upside down position after which the bottom plate is fitted.

According to a preferred feature of this invention, there is a screw closure between the applicator and the container, and in the screwed-in position of the applicator the sponge is compressed against the container bottom through a distance at least equal to the screw-in distance. The advantage is that the applicator need not be screwed in and out each time when, in use, the sponge must be dipped into the polish into contact with the bottom.

In the closed condition of the dispenser, the sponge is always immersed in liquid and, consequently, cannot dry out.

Preferably, the passage from the container to the central cavity is annular and is bounded on the one hand by the bottom plate and on the other hand by a sharp scraper edge extending inwardly from the lower end of the inner wall of the container, by means of which drop formation at the sponge is prevented as the applicator is being taken out.

When, furthermore, the inner wall of the container is formed with a wider upper portion which is connected through an inclined transition to a narrower lower portion, and the applicator is provided above the sponge with a resilient annular edge projecting therefrom, which in unloaded condition has an outside dimension larger than the inside dimension of the narrower lower portion of the container inner wall, as the applicator is being screwed in, the resilient annular edge slides over the inclined transition between the broader and the narrower portion of the container inner wall and ensures an airtight closure of the liquid in the central cavity.

The cooperation of the annular edge with the container inner wall, moreover, has the effect that when the dispenser is being closed, a small amount of air is pumped into the container, so that inflow of liquid to the central cavity is promoted.

In a further elaboration of the present invention, the applicator is further provided with a grip cap having a free outer edge which, in the screwed-in position of the applicator, abuts sealingly against a corresponding shoulder formed in the outer wall of the container.

When the dispenser is closed, there are two additional closures besides the screw closure

which prevent drying out, i.e. at the external shoulder and at the inner wall of the container, direct above the sponge.

Such a dispenser functions excellently as long as the container is kept upright when the dispenser is open. It is therefore recommendable for the container, when in use to be placed on a flat base, for if the container is canted over while the applicator is being removed from the container, air can penetrate the container and the hydrostatic equilibrium is discontinued temporarily and when the container is again placed in vertical position, equilibrium is established at too high a liquid level in the central cavity.

If it is felt as a drawback for the opened dispenser to be kept always in a vertical position, then according to the present invention, the annular passage between the container and the central cavity can be shut off by a plate having a larger diameter than the central cavity and being an axially sliding fit in a cavity formed in the container bottom, and which plate is spring-biased towards the lower edge of the container inner wall, with the applicator being fitted with an extension extending through the sponge, by means of which, with the applicator being in the screwed-in position, the closure plate can be pressed downwards against spring action for clearing the passage.

In this embodiment, the passage between the container and the central cavity is shut off by the plate as soon as the applicator is removed from the central cavity. Even if the container is inclined, no polish can flow in.

To enable withdrawl of polish from the dispenser by intermediate dipping, according to the present invention, at least one of the coacting threaded portions can be made resilient, e.g. from elastomeric material.

As a result, through deformation of the screw thread, the sponge can be dipped into the liquid at the bottom of the central cavity by axial compression of the applicator.

An alternative, constructively chearper embodiment preventing polish from flowing from the container to the central cavity when the open dispenser is canted over is that wherein a baffle is provided in the bottom zone underneath a cover plate, which baffle extends from a position at the container outer wall with a spiral portion to the diametrically opposite side of the container inner wall and which, with a following portion, follows the contour of the container inner wall and terminates within the corner zone comprised by the spiral portion.

In this embodiment, there is formed between the container space and the central cavity a kind of water seal with an open communication with the container space on the convex side of the spiral portion of the baffle and a passage to the central cavity that is restricted by the other portion of the baffle on the concave side of said portion. In each position of the dispenser, polish flow from the container to the central cavity is prevented.

Some embodiments of the dispenser according to the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a part-sectional elevation of the dispenser in a first embodiment, showing in the left part the dispenser in closed position and in the right part in opened position;

Figs. 2A and 2B show the container in upright and in an inclined position, respectively;

Fig. 3 shows the application of polsih with the applicator;

Fig. 4 is a part-sectional elevation of the dispenser in a second embodiment, shown again at the left in closed and at the right in opened position;

Fig. 5 is a cross-sectional view of a third embodiment of the dispenser with the container and the applicator shown separately;

Fig. 5A is a cross-sectional view taken on the line A-A of Fig. 5;

Fig. 6 shows the dispenser of Fig. 5 in horizontal position;

Figs. 6A-6D show various angular positions of the horizontal dispenser according to Fig. 6; and

Figs. 7-10 show variants of the dispenser according to Fig. 5.

In the embodiment shown in Figs. 1-3, the dispenser is composed of a container 1 and an applicator 2 connectable thereto by a screw thread 3 to close container 1. It is clear that other closing mechanisms, such as a bayonet fit, can in principle be used.

The container has a cylindrical outer wall 4 merging via a closed upper wall 5 into a cylindrical inner wall 6, which is connected through an inclined transition 7 to a narrowed lower portion 8 having a sharp, inwardly extending, lower scraper edge 9. The container is closable at its lower end with a bottom wall 10. The cylindrical outer container wall 4 has a shoulder 11 at the transition to an upper wall 5.

Disposed between the concentric container walls 4 and 6 is a reservoir 12 which communicates via a passage 13 between scraper edge 9 and bottom plate 10 with an adjoining space, in this case a central cavity 14.

The applicator 2 consists of a shank 15 having a projecting resilient annular edge 16 above a material- receiving end, in this case a sponge 17 having substantially the same diameter as central cavity 14.

In opened condition, as shown on the right in

Fig. 1, sponge 17 rests on bottom 10 in the non-compressed condition. The coacting parts of screw thread 3 are out of engagement with each other. When applicator 2 is screwed into container 1, the applicator moves downwards through a distance -a- and the sponge is axially compressed through the same distance -a-Applicator 2 further has a grip cap 18 having a free outer edge 10 which, when the dispenser is closed, sealingly abuts against shoulder 11.

In closed condition, as shown on the left in Fig. 1, sponge 17 is compressed against bottom 10 and dipped in shoe polish the level of which in central cavity 16 is indicated at 20. The higher polish level in the adjoining container space 12 is indicated at 21 and is maintained by subatmospheric pressure prevailing underneath container upper wall 5. When applicator 2 is unscrewed and withdrawn from the container, an amount of polish absorbed by sponge 17 is taken along and can be applied to a shoe in the manner shown in Fig. 3. Owing to the removal of polish from central cavity 14, level 20 drops until air can flow through passage 13 into container space 12. As a result, the partial vacuum prevailing above the polish in container space 12 is reduced and polish can flow through passage 13 to central cavity 14 until level 20 is restored, i.e. when the hydrostatic equilibrium condition has been reached.

For intermediate dipping of sponge 17, applicator 2 need not always be screwed in, because, as shown on the right in Fig. 1, in the non-compressed state sponge 17 is long enough to reach bottom 10.

Figs. 2A and 2B show container 1 in opened condition, upright, and in an inclined position. As shown in Fig. 2B, in the event of too large an inclination, air can flow into container space 12, so that the hydrostatic equilibrium is disturbed. When the container is placed upright again, a level will adjust itself in central cavity 14 that is higher than the level 20 shown in Fig. 1. The unwanted result is that when the sponge is dipped, too much polish is absorbed.

A variant embodiment which is insensitive to the tilting of an opened container is shown in Fig. 4, wherein corresponding parts are indicated by like reference numerals as in Figs. 1-3.

This variant embodiment is distinct from the embodiment shown in Figs. 1-3 by the presence of a closing plate 23 having a larger diameter than central cavity 14 and being received in a cavity 24 formed in the bottom 10′, in which cavity 24 plate 23 is slidable and is loaded upwards by a spring 25. Furthermore, the applicator is provided with an extension 26 engaging with plate 23 and in the embodiment shown, the screw thread 3′ is made at least partly, of resilient material, e,g. an elastomer.

In the closed position shown on the left in Fig. 4, plate 23 is pressed downwards by extension 26 of applicator 2 and clears passage 13, so that level 20 can adjust itself in central cavity 14. Sponge 17 is adapted to absorb polish. When applicator 2 is loosened it moves up through a distance -b-, while sponge 17 expands and plate 23 moves upwards into contact with scraper edge 9. As a result, passage 13 from container space 12 to central cavity 14 is shut off and no polish can flow in even when the container is tilted. When after repeated dipping of the applicator, the quantity of polish isolated in the central cavity has been consumed, plate 23 has to be pressed downwards temporarily for replenishment. To permit this without having to screw in the applicator, screw thread 3′ is resilient.

An alternative embodiment wherein tilting of the container does not disturb the hydrostatic equilibrium either, but in which this effect is achieved otherwise, i.e. without moving parts, is shown in Figs. 5-6D. Again, corresponding parts are designated by like reference numerals as in Fig. 1.

This embodiment is distinct by the presence of a baffle 27 at the bottom of container 1. Baffle 27 extends between cover 28 and container bottom 10, with a spiral portion 30 from a position 29 at the container outer wall 4 to a position 31 at the diametrically opposite side of the container inner wall 6 and follows with an arcuate portion 32 the contour of the container inner wall 6 to a position 33 within the corner zone (α) enclosed by spiral portion 30.

At the bottom of container 1 underneath cover 28 baffle 27 forms a kind of water seal which, on the convex side of spiral portion 30, at the end 34 of cover 28, communicates with container space 12 and on the concave side of the spiral portion 30, is in open communication with central cavity 14 through the - restricted - passage 13′.

As shown in Figs. 6, 6A-6D, even in the event of a container 1 lying on its side, irrespective of its rotational position, polish will never be able to flow from container space 12 to central cavity 14.

Figs. 7-10 show variants of the embodiment shown in Fig. 5, which have in common with this embodiment that baffle 27 underneath cover plate 28 has a curved portion, extending at least substantially concentrically with the container inner wall and which is connected to the container inner wall 6 and/or to the container outer wall 4 in such a manner that between the bottom 10 of container 1 and cover plate 28, there is formed near the or each baffle 27 a kind of water seal that communicates on the convex side of baffle 27 with container space 12 and on the concave side with container inner space 14.

Claims

1. A dispenser for liquid material, such as shoe polish, comprising a container and an applicator by means of which a small quantity of the material can be removed from the container by dipping and be applied to a surface to be treated with the material, characterized in that the container (1) is constructed as a space (12) closed at the upper end which communicates exclusively through a passage (13) at its lower end with an adjoining space (14) which is closable by the applicator (2).

2. A dispenser as claimed in claim 1, characterized in that the container (1) is constructed as an annular space (12) closed at the top (5) and bounded by an outer wall (4) and an inner wall (6), said space (12) communicating through a passage (13) near a continuous bottom (13) with a central cavity (14) which is closable by an applicator (2) having at its lower end an end portion receiving material through absorption, in particular a sponge (17) having substantially the same diameter as the central cavity (14), in such a manner that when said container (1) is closed said sponge (17) is in contact with the container bottom (10).

3. A dispenser as claimed in claim 2, characterized in that there is provided a screw closure (3) between the applicator (2) and the container (1) and in the screwed-in position of the applicator (2) the sponge (17) is compressed axially against the container bottom (10) through a distance (a) at least equal to the screw-in distance (a).

4. A dispenser as claimed in claim 2 or 3, characterized in that the passage (13) from the container (1) to the central cavity (14) is annular and is bounded on the one hand by the bottom plate (10) and on the other hand by a sharp scraper edge (9) extending inwardly from the lower end of the inner wall (6) of the container (1), by means of which edge drop formation at the sponge (17) is prevented upon withdrawal of the applicator (2).

5. A dispenser as claimed in any one of claims 2-4, characterized in that the inner wall (6) of the container (1) is formed with a broader upper portion (6) connected through an inclined transition (7) to a narrower lower portion (8), and the applicator (2) is provided above the sponge (17) with a resilient annular edge (16) projecting therefrom, said edge (16), in unloaded condition, having an outside dimension larger than the inside dimension of the narrower lower portion (8) of the container inner wall (6).

6. A dispenser as claimed in any one of claims 2-5, characterized in that the applicator (2) is provided with a grip cap (18) having a free outer edge (19) which, in the screwed-in position of the applicator (2), abuts sealingly against a corresponding shoulder (11) formed in the outer wall (4) of the container (1).

7. A dispenser as claimed in any one of claims 2-6, characterized in that the annular passage (13) between the container (1) and the central cavity (14) is shut off by a plate (23) having a larger diameter than the central cavity (14), said plate being an axially sliding fit in a cavity (24) formed in the container bottom and being biased by a spring (25) towards the lower edge (9) of the container inner wall (6), with the applicator (2) being fitted with an extension (26) extending through the sponge (17), by means of which, with the applicator (2) being in the screwed-in position, the closure plate (23) can be pressed downwards against spring action for clearing the passage (13).

8. A dispenser as claimed in claim 7, characterized in that at least one of the coacting threaded portions (3′) is made resilient, e.g. of elastomeric material.

9. A dispenser as claimed in any one of claims 2-6, characterized in that there is provided in the bottom zone underneath a cover plate (28), at least one baffle (27) having a curved portion extending at least substantially concentrically with the container inner wall and being connected to the container inner wall (6) and/or to the container outer wall (4) in such a manner that between the bottom (10) of the container (1) and the cover plate (28) there is formed near the or each baffle (27) a kind of water seal communicating on the convex side of the baffle (27) with the container space (12) and on the concave side with the container inner space (14).

10. A dispenser as claimed in claim 9, characterized in that the baffle (27) extends from a position (29) at the container outer wall (4) with a spiral portion (30) to the diametrically opposite side (32) of the container inner wall (6) and with a following portion (32), follows the contour of the container inner wall and terminates (33) within the corner zone (α) (Fig. 5, 5a) enclosed by the spiral portion (30).

11. A dispenser as claimed in claim 9, characterized in that a single baffle (27) extends from a position (29) at the container outer wall (4) with a straight portion (30a) passing tangentially into a portion (30) extending concentrically around the container inner wall (6), which portion (30) terminates near the straight portion (30a) (Fig. 7).

12. A dispenser as claimed in claim 9, characterized in that two baffles (27) extend from diametrically opposite positions (29) with looped portions (30) to portions (32) following the contour of the container inner wall, each of the baffles (27) terminating within the corner zone (Fig. 8) enclosed by the opposite baffle (27).

13. A dispenser as claimed in claim 9, characterized in that the curved portion (30) of the or each baffle (27) extending at least substantially concentrically with the container inner wall is con-

nected at one end to portions (32) following the contour of the container inner wall, and the other end of the curved portion (30) terminates a short distance from a substantially radial baffle (30b) connecting the container outer wall (4) with a portion (32) following the contour of the container inner wall (6) (Figs. 9, 10).

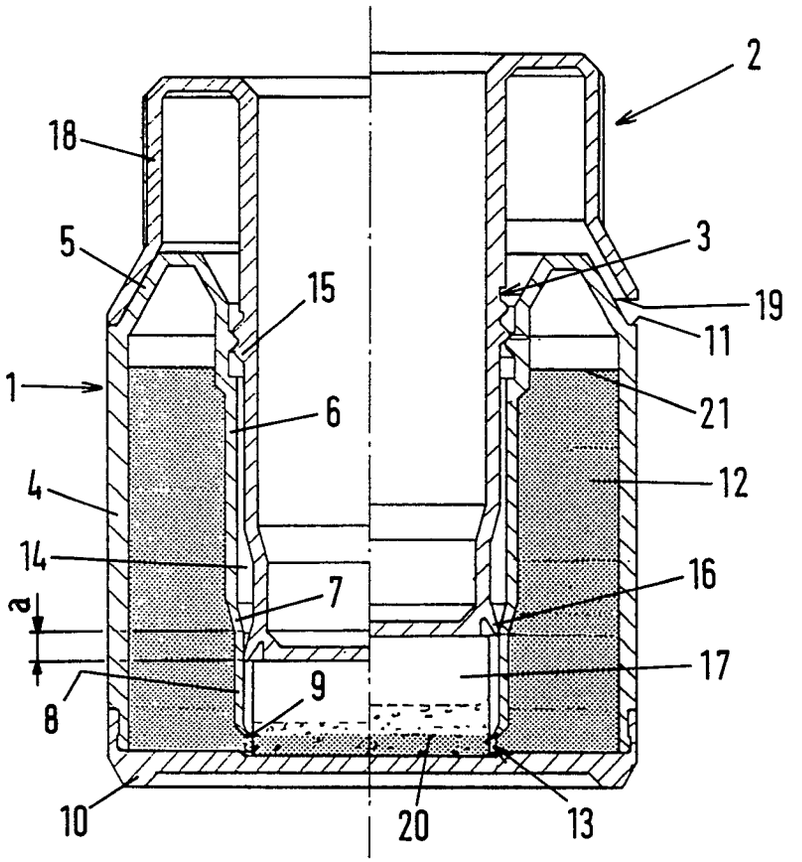


FIG.1

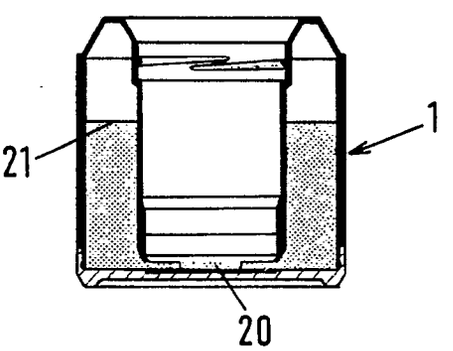


FIG.2a

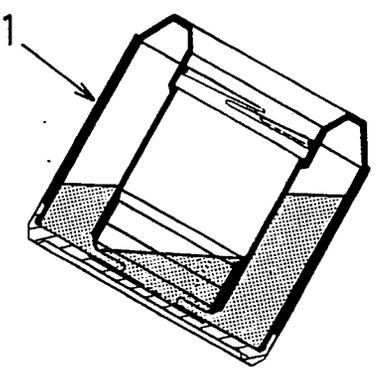


FIG.2b

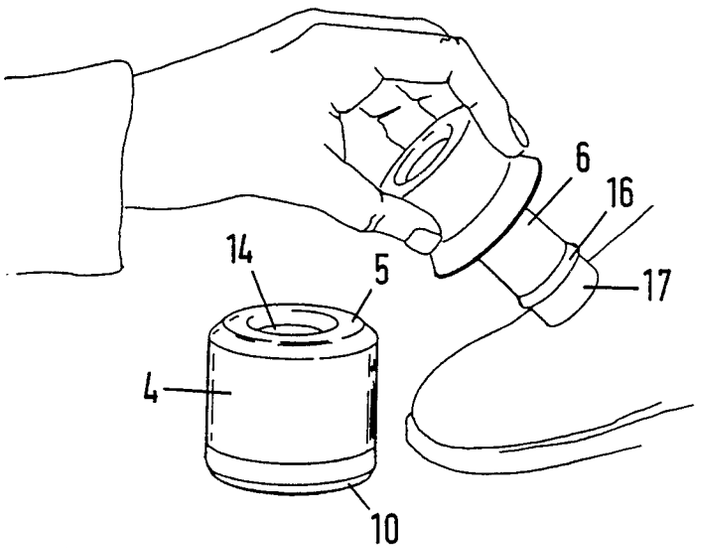


FIG.3

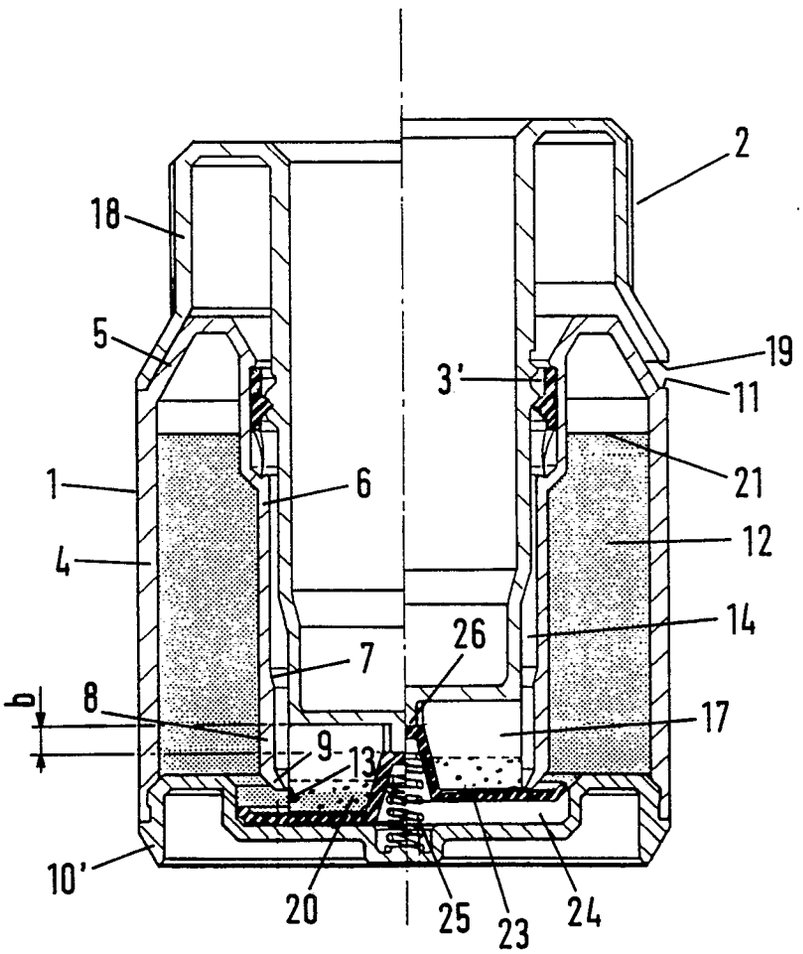
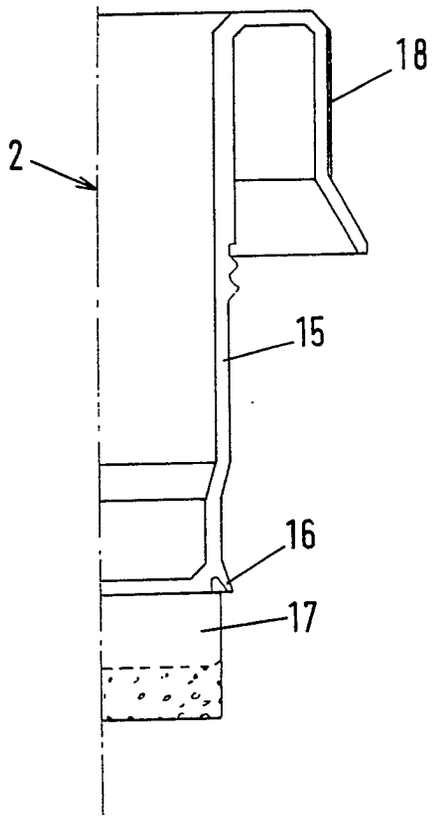


FIG.4


18
2
15
16
17

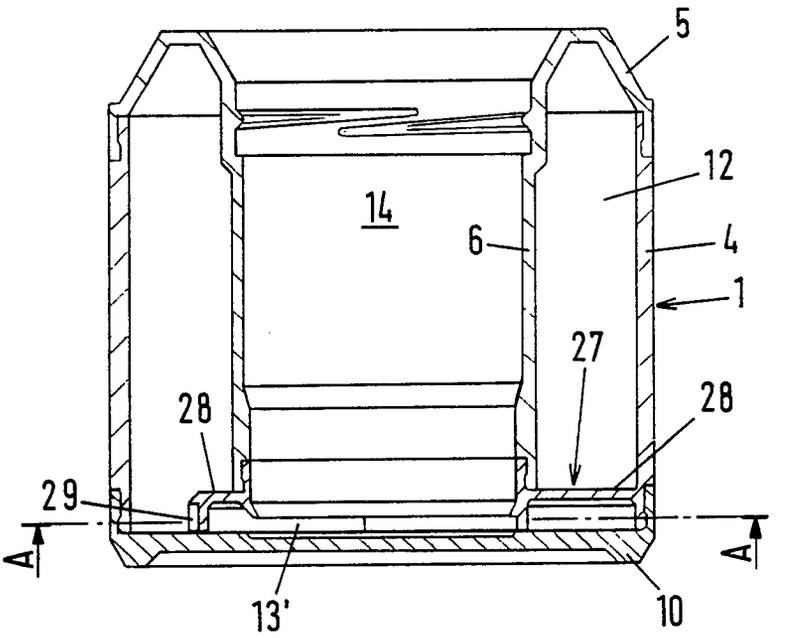

5
12
14
6
4
1
27
28
28
29
A
A
13'
10

FIG.5

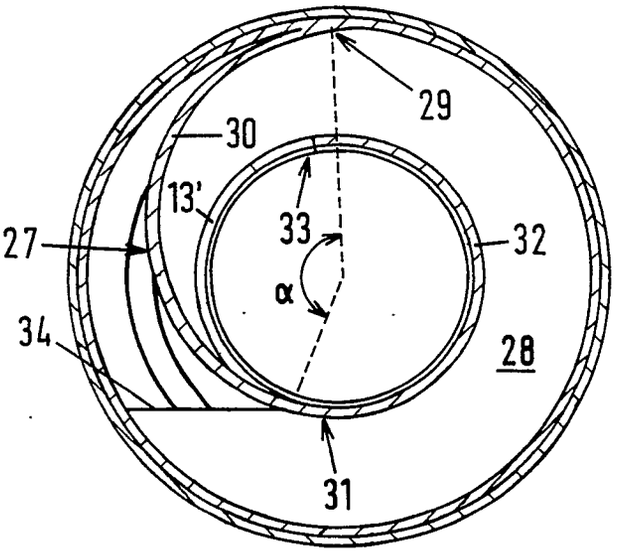
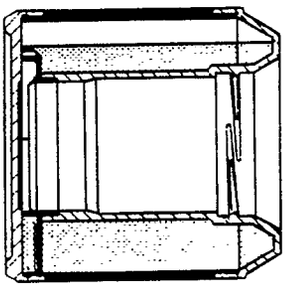

29
30
13'
33
32
27
α
34
28
31

FIG.5a

FIG.6



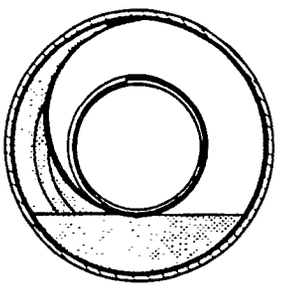


FIG.6a

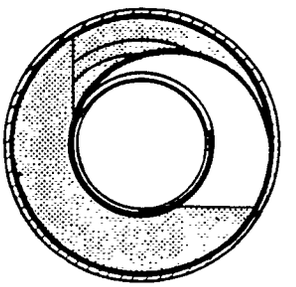


FIG.6b

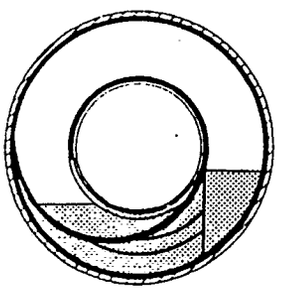


FIG.6c

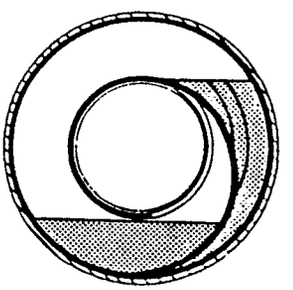


FIG.6d

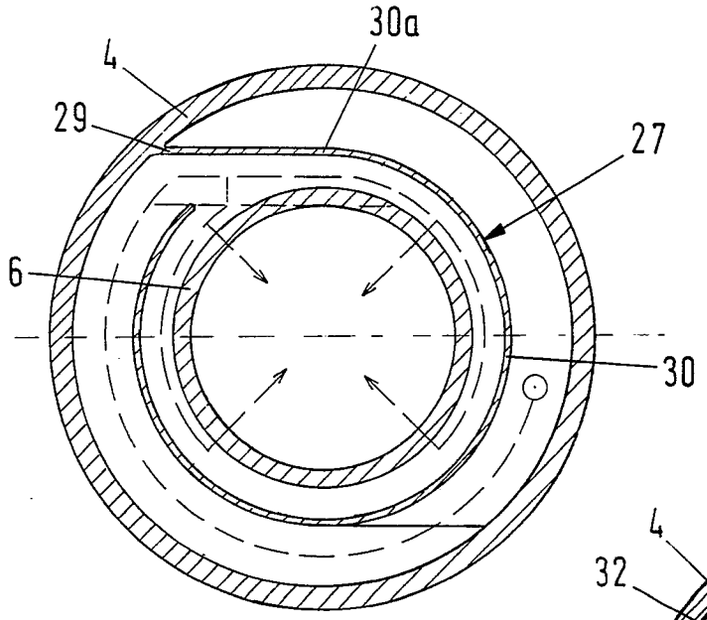


FIG.7

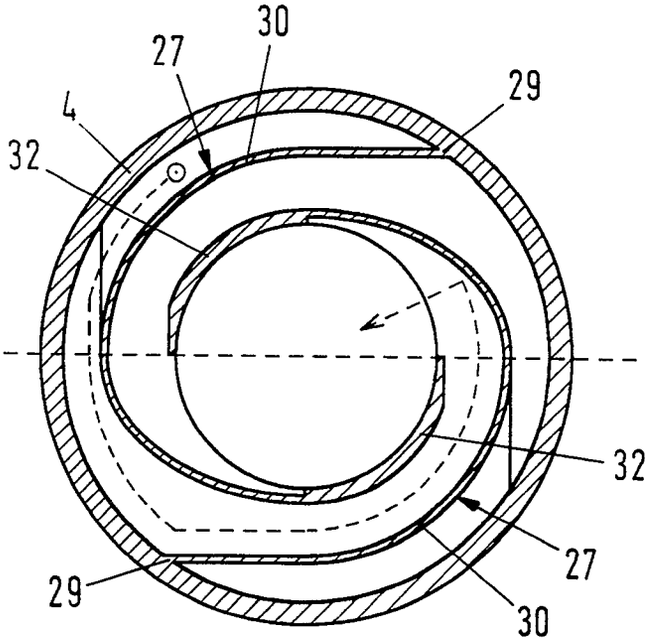


FIG.8

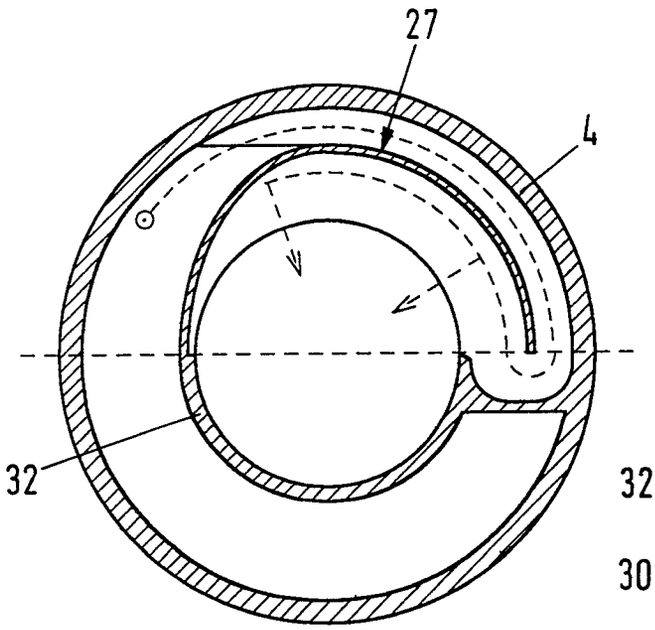


FIG.9

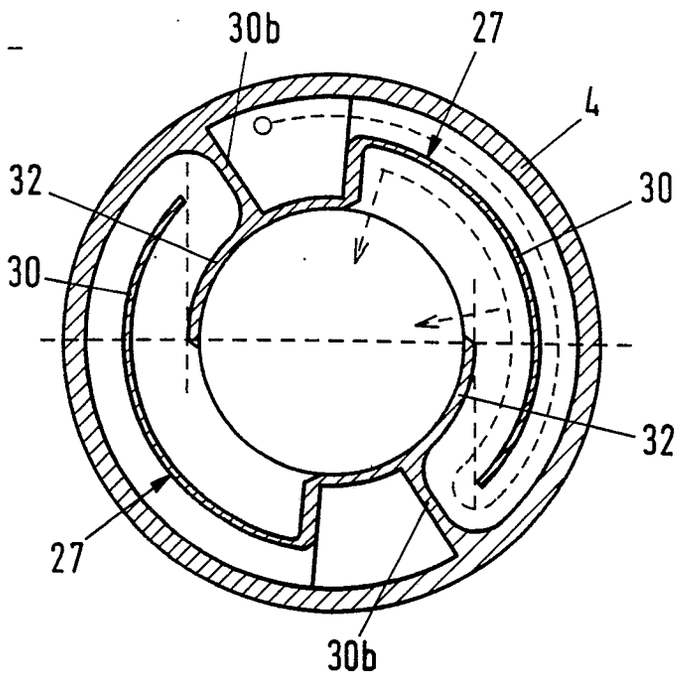


FIG.10

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 90 20 0168

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.5)
X Y	DE-U-8 713 273 (E. MAASSEN) * Figures 1,2; page 3, lines 12-25 *	1 2	B 65 D 51/32 A 47 L 23/05
Y	FR-E- 86 430 (A. ROBIN) * The entire document *	2	
A	FR-A-1 131 324 (G. KRIEGHOFER) * The entire document *	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B 65 D
A 47 L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	20-04-1990	PERNICE, C.

CATEGORY OF CITED DOCUMENTS

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D : document cited in the application
L : document cited for other reasons

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EPO FORM 1503 03.82 (P0401)