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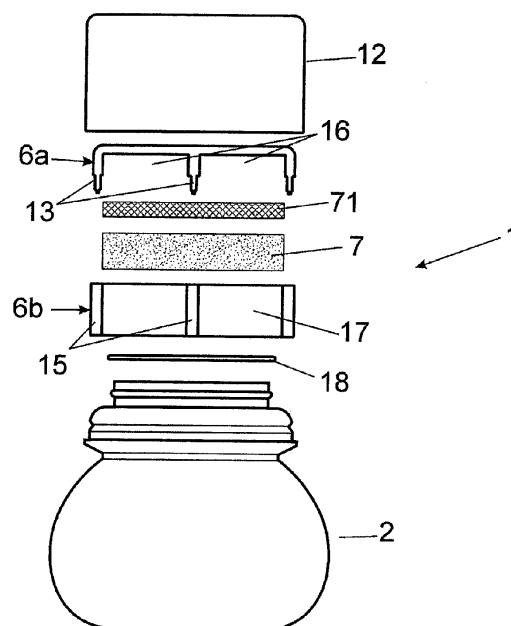
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(54) **DETERGENT DOSING DEVICE FOR DISHWASHERS**

(57) A DETERGENT DOSING DEVICE FOR DISHWASHERS, consisting of a plastic container (2) that has a pierced dosing lid (6) which is also made from plastic and which houses a sponge (7) therein that completely covers the mouth (10) and a protective lid (12) made from plastic which completely covers said dosing lid (6). The dosing lid (6) is formed by two pierced or slatted bases (8) and several walls (9) that join same, forming a space in which the sponge (7) is tightly housed. In addition, it includes inferiorly several pins (11) which keep it secured to the container (2) by inserting the ends thereof into a peripheral groove. Optionally, the dosing lid (6) is divided into two detachable parts, namely an upper part (6a) and a lower part (6b) with the ring-shaped sponge (7) and fibre disc (71) including a silicon seal (18) that fits into the mouth of the container (2).



**Fig. 4**

## Description

### OBJECT OF THE INVENTION

**[0001]** The invention, as stated in the wording of the present descriptive memory, relates to a detergent dosing device for dishwashers, which provides several novel advantages and characteristics to the function it is designed for, which will be described in detail below and represent a remarkable improvement compared to what is already known in the market within its field of application.

**[0002]** More specifically, the object of the invention relates to a device designed for achieving optimal dosing of the cleaning products used in dishwashers, particularly for industrial applications, such that the detergent, rinse aid and bleaching agent will be more concentrated and will dissolve by themselves slowly and gradually over many washes, about two hundred washes, avoiding the need to manually dose for every wash and further saving on storage space.

### FIELD OF APPLICATION

**[0003]** The field of application of the present invention falls within the industry engaged in the manufacture of detergent dosing devices, focusing primarily on dishwashers, and more specifically, to professional or industrial dishwashers.

### BACKGROUND OF THE INVENTION

**[0004]** As a reference to the state of the art, it should be noted that while the existence of some detergent dosing devices are currently known, these will normally be limited to being containers with holes or grids in which a detergent tablet is housed which dissolves on contact with water.

**[0005]** However, such dosing devices have the drawback that, if the holes are too large, the detergent tablet dissolves quickly when the water penetrates inside, and therefore, there can be no prolonged use thereof as the detergent will have been completely used up in only a few washes. If the holes in the dosing device are very small, they may become clogged and then the detergent does not dissolve properly, therefore washing is not optimal.

**[0006]** The aim of the present invention, therefore, is to provide the market with a new dosing device which avoids the drawbacks described above, which is achieved by fitting a retaining lid with sponge thereto which, allowing the passage of water, makes it possible to prevent the detergent from dissolving too quickly.

**[0007]** On the other hand, with the standard device, in addition to the dosing no longer being manual, dosing pumps do not have to be fitted, which is another advantage, since fitting these types of pumps involves handling the dishwasher, which would also be avoided.

**[0008]** Most known detergent dosing devices are limited to containers comprising holes or grids in which a detergent tablet is housed which dissolves upon contact with water, most of them intended for use in domestic washing machines or dishwashers, such as that described in document WO 2006134338 A1, regarded as closest to the state of the prior art and which consists of a device for constantly providing a dissolution of a solid product which has openings for water to pass through which are sealed by a water permeable element.

**[0009]** The standard device, however, is specially designed for professional dishwashers, which have a very specific washing system and which differs from the that of conventional washing machines or dishwashers.

**[0010]** In particular, said types of professional dishwashers have a tub on the lower part thereof. When the dishwasher is turned on, said tub that contains the wash water is filled with water which is heated by means of a resistance provided for this purpose. The wash water should be drained manually, therefore, during a washing cycle (when the water in the tub is not changed), the water that is used to wash is always the same, as it is recirculated through an inner circuit and exits through the sprinklers.

**[0011]** If liquid detergent is used, a peristaltic pump that dispenses detergent during the initial load of water and during rinsing (for the next wash) must be installed.

**[0012]** The professional dishwasher also has a smaller tub called a cylinder where the rinse aid mixed with water at high temperature is contained. If a liquid rinse aid is used, it is dosed via a peristaltic pump to the cylinder during the rinsing process and the rinse aid required for the next washing process is dosed each time.

**[0013]** The water level in the tub is controlled by a stopper in the tub, which consists of a tubular plastic part that is hollow in the middle. The lower part of said tubular part is inside the dishwasher structure, at the bottom of the tub. The height of the tubular body is the height of the water that will be in the tub, and the excess water is removed through a number of holes provided for this in the upper part of the tubular body. When the tub is filled, the water occupies the central part of the tube, but during rinsing, as more water is filled part of the water from the tub is removed through the upper holes of this tube-shaped plug, together with the fats and oils that float. This is why liquid detergent is dosed during the rinse cycle of each washing process, to recover what is lost.

**[0014]** Therefore, using the standard device means it is not necessary to use detergent or liquid rinse aid, nor peristaltic pumps for dosing, since it uses the movement of water within the dishwasher to dose the detergent and rinse aid at the same time.

**[0015]** The operating system is based on a slow dosing which, as the washing is carried out, detergent and rinse aid are dosed. The wash water that falls through the sprinklers saturates the foam from the device, which is embedded within the dosing lid which is arranged at the top of the device, causing the plastic container, which is un-

der said dosing lid, to be filled with water thereby dissolving the solidified detergent paste, and as water continues to fall on the foam, this is mixed with soapy water and rinse aid inside the container (yellow arrows). This process continues for each wash and until the detergent has been used up. The detergent and rinse aid is thus dosed in a controlled manner during each wash process.

**[0016]** It is also important to note that the proposed device is designed to always be positioned vertically, a dosing lid being provided that is specially designed to facilitate the exchange of water and detergent during the washing process, avoiding detergent spills if the device is handled, as said detergent may be a corrosive product.

**[0017]** It should be noted, therefore, that the applicant is not aware of any other detergent dosing device for dishwashers, or any other invention for a similar application, having technical, structural and constitutive characteristics similar to those presented by the device advocated herein and whose characteristic details are conveniently contained in the final claims that accompany the present descriptive memory thereof.

## DISCLOSURE OF THE INVENTION

**[0018]** Therefore, the detergent dosing device for dishwashers which the invention proposes, designed for professional and industrial use, is configured from a plastic container containing the solidified detergent, consisting of either a solidified detergent paste, two rinse aid tablets and a bleaching tablet or a paste that includes detergent, rinse aid and bleaching agent, with the characteristic that said container is covered with a plastic dosing lid with a sponge and a protective plastic lid that covers the dosing lid.

**[0019]** In a preferred embodiment of the invention, the dosing lid comprises two pierced bases joined together forming a space in which a sponge made from foam or similar material is housed. Each base has holes to let the water pass through and in turn retain the sponge.

**[0020]** It is worth noting that in said embodiment said sponge fills the space between the two bases of the dosing lid, to prevent water from penetrating into the container without passing through it.

**[0021]** In an alternative embodiment, the dosing lid described is divided into two detachable parts, namely one upper part and one lower part, that are coupled together, each one of said parts matching the said pierced bases of the lid.

**[0022]** For coupling, the upper part has several side legs which fit into a number of vertical holes provided in matching positions in the lower part, being important to point out that said legs determine the existence of side holes in the upper part of the dosing lid, while the lower part does not have sides holes, as it has a perimeter partition wherein the aforementioned vertical holes where the legs of the upper part fit in.

**[0023]** On the other hand, the sponge provided inside the dosing lid, instead of consisting of a solid body, is

configured in a ring shape that fits the inner diameter of the dosing lid, and whose height is slightly smaller than the space between the bases on both sides of the lid; a fibre disc having been fitted thereon which occupies the remaining space on the lower part of the dosing lid.

**[0024]** This particular arrangement of the ring-shaped sponge and the fibre disc thereon, provides a covering for the holes of the dosing lid which allows the water to pass through inside the container in which the detergent is housed, prevents spills of dissolved liquid detergent when the device is handled.

**[0025]** Therefore, the foam ring is impregnated with liquid but does not overflow, while the upper fibre disc allows the water to flow more easily in and out of the device, facilitating cleaning when the dishwasher is operating, but which in turn, if handled, provided it remains in a more or less vertical position, prevents spillage of liquid from the top of the dosing lid.

**[0026]** It should also be noted that to facilitate the side sealing of the dosing lid even more, provision has been additionally made for fitting a silicone seal between the container and the bottom of the dosing lid.

**[0027]** In turn, the protective lid is a conventional plastic lid that is removed when using the device and until such time that the dosing lid completely covers the dosing lid protecting the contents of the dosing device against moisture, impacts or other effects.

**[0028]** The instructions for using the dosing device is as follows: place the dosing device (without the upper protective lid) in the dishwasher basket, arranged with the dosing lid facing upwards, do a first activation wash (so there is some detergent in the water) and continue with normal daily washes.

**[0029]** It should be remembered that, generally, in professional or industrial dishwashers, at the start of a service (breakfast, lunch, etc.) the tank is filled with water, and the same water is used for the washes in the entire service, but in each wash the supernatant or surface portion is discarded, where the fats and oils usually are, being filled with clean water.

**[0030]** The operating system of the dosing device of the invention is based on slow dosing with which, as the washes are put on, the detergent is gradually dosed, therefore the detergent that is discarded with the waste water is recovered in the next wash.

**[0031]** The wash water that flows through the sprinklers soaks the sponge of the dosing lid and causes the container to fill with water; the solidified detergent paste and the rinse aid and bleaching tablets dissolve and, as water keeps falling on the sponge, this mixes with the soapy water inside the container. This process continues for each wash and until the detergent has been used up.

**[0032]** Optionally, the detergent contained in the container, instead of consisting of a solidified detergent paste and rinse aid and bleaching tablets, it is a specific formulation paste which comprises a detergent, rinse aid and bleaching agent in one single product.

**[0033]** In any case, the device enables slow dosage of

detergent, thereby avoiding having to manually dose at the beginning of each service. It further has high durability, being able to perform more than 200 washes with the same unit.

**[0034]** As the detergent is a concentrated product with high durability, and small in size, it requires much less space for storage. Another advantage in respect of its storage is that as it is a solid product, there is no question of spills or leaks occurring, that may happen with conventional liquid products.

**[0035]** Also, the device of the invention, in addition to the detergent, further includes rinse aid and bleaching agent, therefore there are three products in one that are dosed during many washes.

**[0036]** The detergent of the device, as already said, is a very concentrated product, therefore it is corrosive. By using the sponge splashing and spilling is avoided when handling the trays, since the soapy water is "held" by said sponge.

**[0037]** Finally, it should be noted that the dosage levels may be changed using sponges of different densities, and, if desired, holes may even be put into the sponge to make it easier for water to pass through.

**[0038]** The described detergent dosing device for dishwashers therefore represents an innovative structure, having components and structural characteristics hitherto unknown for this purpose, reasons which linked to its practical usefulness, provide it with a sufficient basis for obtaining the privilege of exclusivity being applied for.

## DESCRIPTION OF THE DRAWINGS

**[0039]** As a complement of the description being made and for a better understanding of the characteristics of the invention, attached to the present descriptive memory and as an integral part of it, is a set of drawings where, for purposes of illustration and in a non-limiting manner, the following is shown:

Figure 1 shows a sectional elevation view of an example of an embodiment of the detergent dosing device for dishwashers of the invention, wherein the main parts and elements comprised therein can be seen, as well as the configuration and arrangement thereof.

Figures 2 and 3, respectively, show an elevation and plan view of the dosing lid of the device according to the invention shown in Figure 1, wherein the pierced configuration thereof and the sponge fitted therein can be seen.

Figure 4 shows an elevation and exploded view of another example of an alternative embodiment of the detergent dosing device for dishwashers, the dosing lid of which is comprised of two parts and which is fitted with the ring-shaped sponge and a fibre disc.

Figure 5 shows an elevation view of the dosing lid of the example of the device of the invention shown in Figure 4, which is shown with the two parts assembled and with the ring-shaped sponge and fibre disc fitted inside.

Figures 6, 7, 8, 9 and 10, respectively, show a plan view of the upper and lower part of the dosing lid, the sponge, the disc and silicone gasket which incorporates the example of the device of the invention shown in Figure 4.

## PREFERRED EMBODIMENT OF THE INVENTION

**[0040]** In view of the aforementioned figures and according to the numbering used, two separate embodiments of the detergent dosing device for dishwashers can be seen therein, which comprises the parts shown and described in detail below.

**[0041]** Therefore, as shown in said figures, the device (1) in question is formed from a plastic container (2) that contains solid detergent, consisting of either a solidified detergent paste (3) one or more rinse aid tablets (4) and a bleaching tablet (5), or a paste having a specific formulation that includes a detergent, rinse aid and bleaching agent in one single product, said container (2) superiorly having a pierced dosing lid (6) which is also made from plastic and which houses a sponge (7) therein.

**[0042]** In a preferred embodiment of the invention shown in Figures 1 to 3, said dosing lid (6) is formed by two pierced or slatted bases (8) and several walls (9) that join same, forming a space between both bases (8) in which the aforementioned sponge (7) is tightly housed which, preferably made from foam or a similar material, completely covers the mouth (10) of the container (2). Furthermore, the dosing lid includes several pins inferiorly (11) which keep it secured to the body of the container (2) by inserting the thickened ends thereof into a peripheral groove provided for that purpose.

**[0043]** Alternatively, as shown in Figures 4 to 10, the dosing lid (6) is divided into two detachable parts, namely an upper part (6a) and a lower part (6b) which are coupled together.

**[0044]** For said coupling of said two parts of the dosing lid, provision has been made for a number of side legs (13) in the upper part (6a) which fit into a number of holes (14) in a number of vertical thickenings (15) provided in matching positions in the lower part (6b), such that said side legs (13) determine the existence of side holes (16) in the upper part (6a) of the dosing lid (6), while the lower part (6b) comprises a perimeter partition (17) wherein there are vertical thickenings (15) with holes (14) where the legs (13) of the upper part (6a) fit in.

**[0045]** Within said dosing lid (6) the sponge (7) is tightly housed (7) which, as seen in Figure 8, is configured in a ring shape that fits the inner diameter of the dosing lid (6), its height being slightly less than the space between the bases (8) on both sides of the dosing lid (6), as on

top of it, also inside the dosing lid (6), provision has been made for a fibre disc (71) that occupies the remaining space.

[0046] Furthermore, in this embodiment, provision has been made for a silicone gasket (18) to be fitted in the mouth of the container (2), between the latter and the bottom (6b) of the dosing lid (6).

[0047] Finally, the device has, in both cases, a protective lid (12) made from plastic which completely covers the dosing lid (6), namely on its top and side, protecting the contents of the dosing device until such time that it is used, and may consist of a snap or screw-close lid.

[0048] Having sufficiently described the nature of this invention and how to implement it, there is no need to provide further explanation for a person skilled in the art to understand its scope and advantages derived therefrom, being noted that, within its essential nature, the standard device may be applied in other embodiments that differ in detail from that shown, by way of example, and which will also be protected, provided its fundamental principle is not altered, changed or modified.

#### Claims

1. A DETERGENT DOSING DEVICE FOR DISH-WASHERS, of the type consisting of a plastic container (2) that contains solid detergent, consisting of either a solidified detergent paste (3), one or more rinse aid tablets (4) and a bleaching tablet (5) or a paste having a specific formulation that includes a detergent, rinse aid and bleaching agent in one single product, **characterised in that** said container (2) has a pierced dosing lid (6) which is also made from plastic and which houses a sponge (7) therein that completely covers the mouth (10) of said container and a protective lid (12) made from plastic which completely covers, namely on its top and sides, the dosing lid (6) protecting the contents of the dosing device until such time that it is used.
2. A DETERGENT DOSING DEVICE FOR DISH-WASHERS, according to claim 1, **characterised in that** the dosing lid (6) is formed by two pierced or slatted bases (8) and several walls (9) that join same, forming a space in which the sponge (7) is tightly housed.
3. A DETERGENT DOSING DEVICE FOR DISH-WASHERS, according to claim 1 or 2, **characterised in that** the dosing lid (6) inferiorly includes several pins (11) which keep it secured to the body of the container (2) by inserting the thickened ends thereof into a peripheral groove provided for that purpose.
4. A DETERGENT DOSING DEVICE FOR DISH-WASHERS, according to any of claims 1-3, **characterised in that** the sponge is made from plastic foam.

5. A DETERGENT DOSING DEVICE FOR DISH-WASHERS, according to claim 1, **characterised in that** the dosing lid (6) is divided into two detachable parts, namely an upper part (6a) and a lower part (6b) which are coupled together; because the sponge is tightly housed (7) inside, with a ring-shaped configuration, its height being slightly smaller than the space between the bases (8) on both sides of the dosing lid (6); and because a fibre disc (71) is fitted on said ring-shaped sponge (7) which occupies the remaining space between the bases (8) of the dosing lid (6).
6. A DETERGENT DOSING DEVICE FOR DISH-WASHERS, according to claim 5, **characterised in that** the coupling of the two parts of the dosing lid (6), in the upper portion (6a) have been provided with side legs (13) which fit into a number of holes (14) in a number of vertical thickenings (15) provided in matching positions in the lower part (6b).
7. A DETERGENT DOSING DEVICE FOR DISH-WASHERS, according to claim 6, **characterised in that** the side legs (13) of the upper part (6a) of the dosing lid (6) determine the existence of side gaps (16) in said upper part (6a), while the lower part (6b) comprises a perimeter partition (17) wherein there are vertical thickenings (15) with holes (14) where the legs (13) of the upper part (6a) fit in.
8. A DETERGENT DOSING DEVICE FOR DISH-WASHERS, according to any of claims 5-7, **characterised in that** provision has been made for fitting a silicone seal (18) that fits into the mouth of the container (2), between the latter and the bottom (6b) of the dosing lid (6).

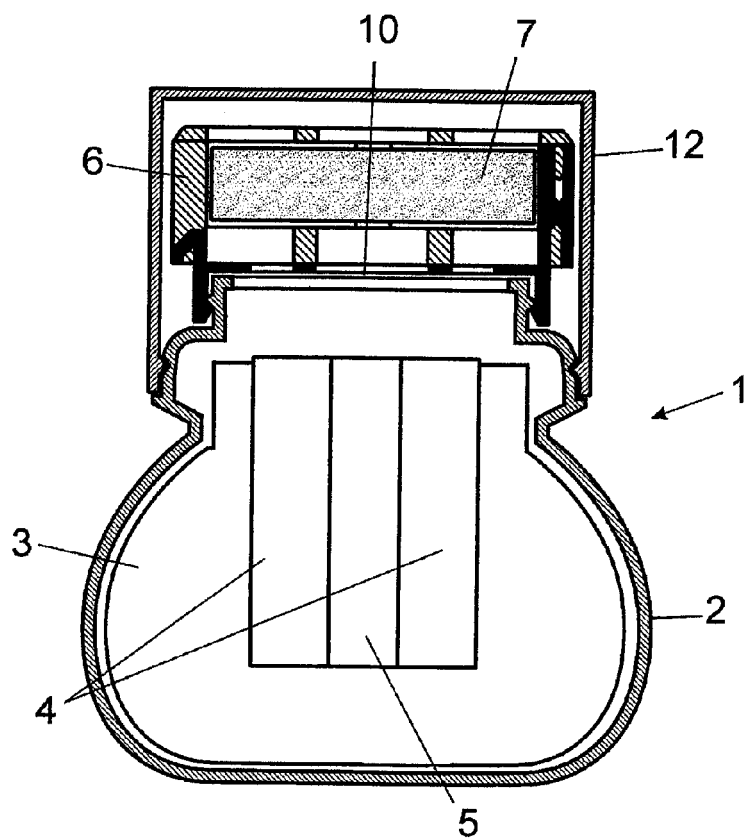


Fig. 1

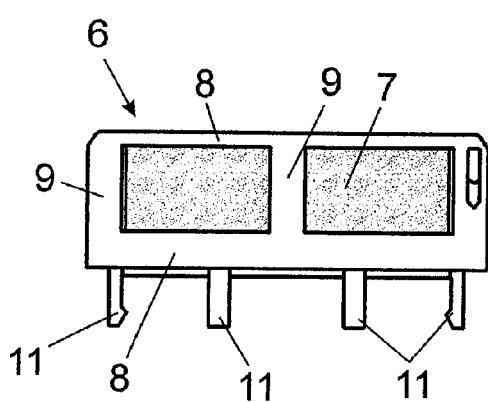


Fig. 2

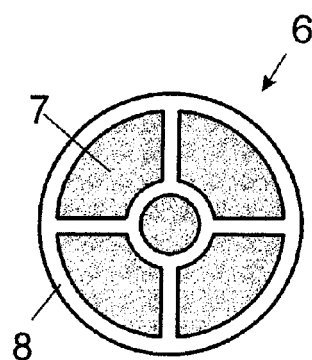


Fig. 3

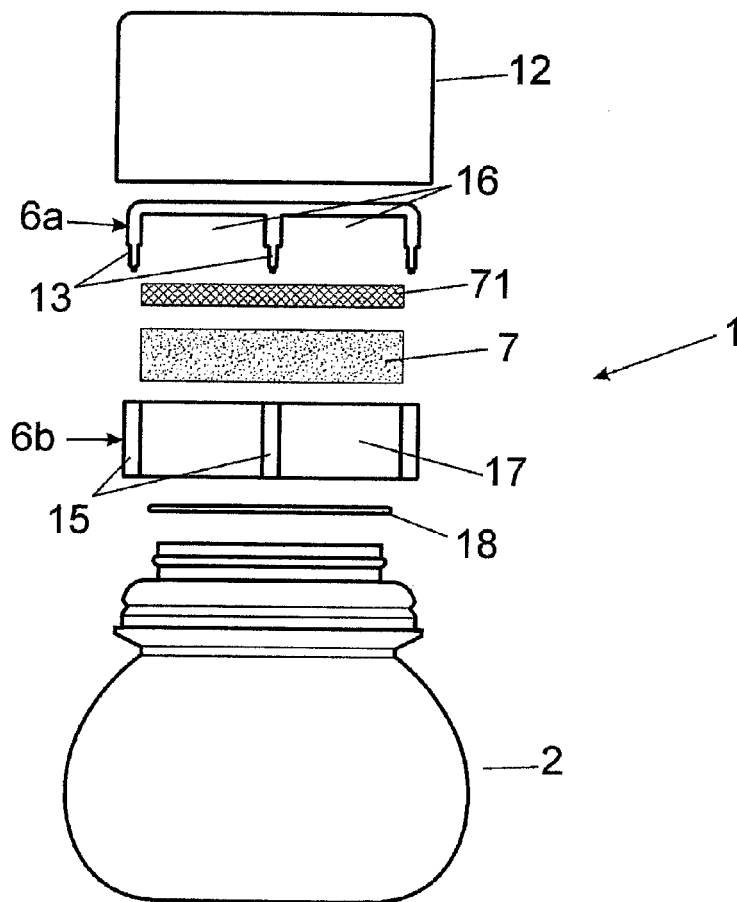


Fig. 4

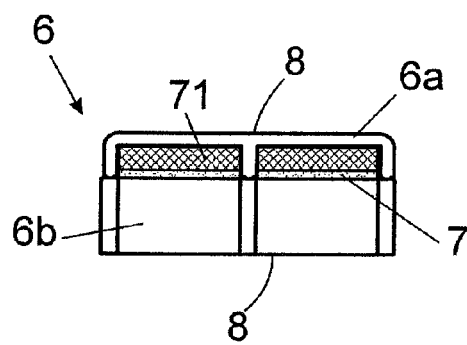


Fig. 5

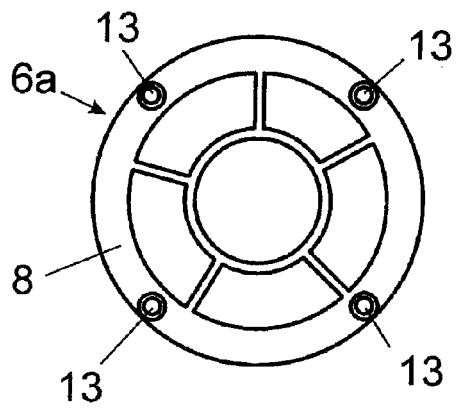


Fig. 6

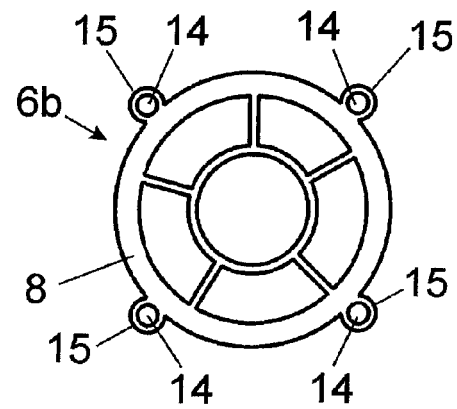


Fig. 7

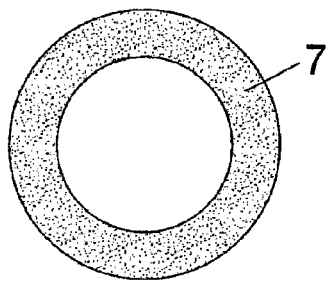


Fig. 8

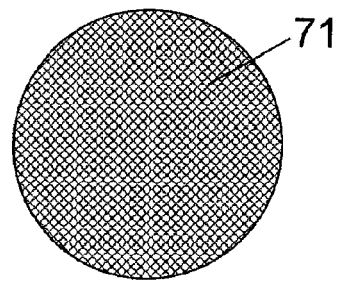


Fig. 9

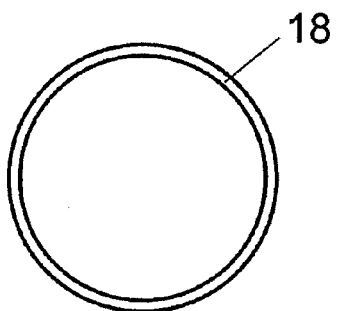


Fig. 10



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2012/070856

## A. CLASSIFICATION OF SUBJECT MATTER

A47L15/44 (2006.01)

B65D43/02 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47L, B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, INVENES

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2006134338 A1 (RECKITT BENCKISER UK LTD ET AL.) 21/12/2006, description; pages 1 - 6; pages 9 - 11; figure 1.	1-4
Y	FR 2519941 A3 (BENCKISER GMBH JOH A) 22/07/1983, description; page 1, lines 1 - 4; page 2, lines 7 - 19; figures.	1-4
A	ES 1009534U U (HENKEL KGAA) 01/09/1989, the whole the document.	1-8
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A	US 4571327 A (LARSON SPENCER B ET AL.) 18/02/1986, abstract; figures.	1-8

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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I. Franco García

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International application No.

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C (continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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