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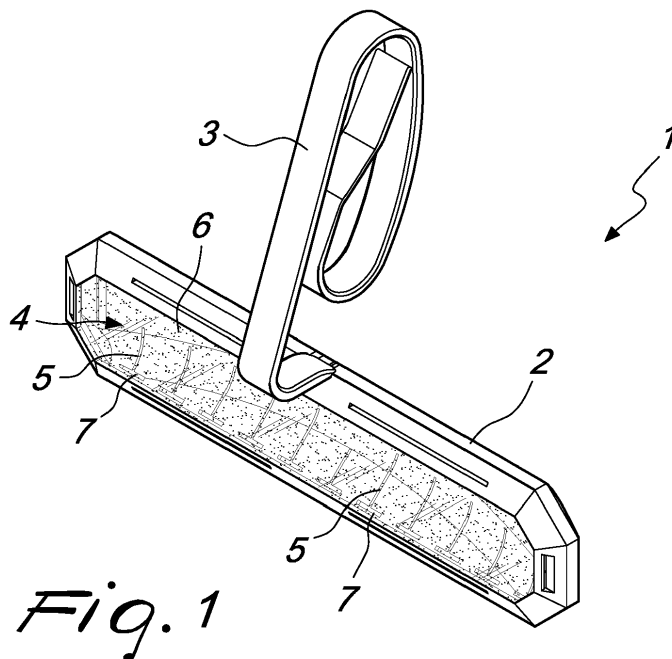
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(54) **SANITIZING DEVICE, PARTICULARLY FOR SANITARY FIXTURES AND THE LIKE**

(57) A sanitizing device, particularly for sanitary fixtures and the like, which comprises an open container body that is adapted to accommodate a sanitizing product, and a stem adapted to enable the clipping of the device to a sanitary fixture; the container body accom-

modates a sanitizing product in gel form that is adapted to be released gradually by the container body as a consequence of the passage of water through the container body.



*Fig. 1*

**EP 3 246 476 A1**

## Description

**[0001]** The present invention relates to a sanitizing device, particularly for sanitary fixtures and the like. More specifically, the invention relates to a sanitizing device that is adapted to release a sanitizing product following the passage of water in contact with it or through it.

**[0002]** As is known, for sanitizing sanitary fixtures devices are used that comprise a form of cage inside which a sanitizing product in tablet form is arranged.

**[0003]** The device is clipped to the sanitary fixture so as to remain in contact with the internal wall of the sanitary fixture, in particular in a position that corresponds to a point where water passes.

**[0004]** When the water is flushed, the water flows over or passes through the containment device of the tablet and the tablet releases sanitizing product in order to sanitize the sanitary fixture.

**[0005]** Currently, sanitization devices comprise containers of the cage type that are adapted to accommodate a product in tablet form which is constituted by a sanitizing product with gradual release. Such tablet is typically constituted by a solid material, accommodated in the cage, which dissolves upon the passage of water in contact with it.

**[0006]** Such tablets, however, have several problems.

**[0007]** Firstly the tablets have an unpleasant appearance, being opaque, and their outward appearance worsens as they are consumed.

**[0008]** Furthermore the tablets are made using inert substances such as sodium carbonate, sodium sulfate, sodium chloride, calcium carbonate etc, in order to confer a solid texture. The purpose of such inert substances are not linked to the performance of the product; they are only needed for the latter to have a solid texture. However, against this, some inert substances used tend to leak and therefore to leave undesired streaks on the inner surface of the sanitary fixture.

**[0009]** Furthermore, given the solid and rich nature of the inorganic substances in the tablet, the latter is very dense, with the drawback that in order to have a tablet of sufficient volume it is necessary to use a relatively high amount by weight of the product, with consequent high costs.

**[0010]** Even furthermore, the presence of inert substances and anionic surfactants is not a factor that favors the yield of the scent during use of the tablet, and the scent is one of the most important features in order to attract the consumer.

**[0011]** An alternative solution known in the background art for sanitizing sanitary fixtures relates to the use of gels, i.e. of adhesive substances in semisolid form, which are applied directly on the inner surface of the sanitary fixture. These solutions too, however, are not devoid of drawbacks. In particular, the application of gel directly on the wall of the sanitary fixture entails the need to come into contact with that wall, a situation that is often unwanted for the user, irrespective of the conditions of

cleanliness of the sanitary fixture. Furthermore, the application of a dose of gel on the wall is a much more complex operation than clipping to that sanitary fixture, since it entails exerting sufficient pressure, so as to make the dose of gel adhere to the wall, and a certain degree of dexterity in manipulating the device for applying the gel, whether it is in the form of a syringe (single dose or multidose) or in the form of a blister.

**[0012]** Finally, liquid tablets are known in which the product is therefore aqueous and free from inert substances. Such tablets contain liquids that are also viscous but, however, they exhibit the drawback of needing to be handled like a liquid and therefore the container that holds them must be perfectly closed, and in order to obtain the desired sanitizing effect it is necessary to provide complex and expensive mechanisms to allow the gradual release of the liquid in use.

**[0013]** The aim of the present invention is to provide a sanitizing device for sanitary fixtures that overcomes the problems mentioned above with reference to the background art.

**[0014]** Within the scope of this aim, an object of the present invention is to provide a sanitizing device for sanitary fixtures that has all the advantages of the product in gel form without the corresponding drawbacks:

- the need for the user to come directly in contact with the internal wall of a sanitary fixture in order to apply the product;
- the use of closed containers and of complicated mechanisms for the gradual release of the product in gel form.

**[0015]** Another object of the present invention is to provide a sanitizing device for sanitary fixtures that maintains a pleasing appearance from the start to the end of its useful life following the gradual release in use of the sanitizing product contained in it.

**[0016]** Another object of the present invention is to provide a sanitizing device for sanitary fixtures that is highly reliable, easily and practically implemented and low cost.

**[0017]** This aim and these and other objects which will become better apparent hereinafter are achieved by a sanitizing device, particularly for sanitary fixtures and the like, which comprises an open container body that is adapted to accommodate a sanitizing product, and a stem adapted to enable the clipping of said device to a sanitary fixture, characterized in that said container body accommodates a sanitizing product in gel form that is adapted to be released gradually by said container body as a consequence of the passage of water through said container body.

**[0018]** Further characteristics and advantages of the invention will become better apparent from the description of preferred, but not exclusive, embodiments of the sanitizing device according to the present invention, which are illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a perspective view of a first embodiment of the device according to the invention;  
 Figure 2 is a side view of the device of Figure 1;  
 Figure 3 is an additional perspective view of the device of Figures 1 and 2;  
 Figure 4 is a rear view of the device of Figures 1-3;  
 Figure 5 is a front view of the device of Figure 1-4.  
 Figure 6 is a perspective view of a second embodiment of the device according to the invention;  
 Figure 7 is a side view of the device of Figure 6;  
 Figure 8 is an additional perspective view of the device of Figures 6 and 7;  
 Figure 9 is a perspective view of a third embodiment of the device according to the invention;  
 Figure 10 is a side view of the device of Figure 9;  
 Figure 11 is an additional perspective view of the device of Figures 9 and 10;  
 Figure 12 is a perspective view of a fourth embodiment of the device according to the invention;  
 Figure 13 is a perspective view of a fifth embodiment of the device according to the invention;  
 Figure 14 is a perspective view of a sixth embodiment of the device according to the invention.

**[0019]** With reference to the figures, the sanitizing device according to the invention, generally designated by the reference numeral 1, comprises an open container body 2 that is adapted to define a form of cage for a sanitizing product, and a supporting stem 3, which is connected to the container body 2 and is adapted to be clipped to the edge of a sanitary fixture.

**[0020]** The supporting stem 3 can be provided at an angle with respect to the front surface of the container body 2, as shown in Figures 1-3, or it can be aligned with the front surface of the container body 2.

**[0021]** Conveniently, the container body 2 is adapted to contain a sanitizing product in gel form 4.

**[0022]** The general term "sanitizing product" is used to mean a sanitizing and/or scented and/or cleaning product.

**[0023]** Conveniently, the container body 2 is provided with a plurality of slits 5 that are adapted to allow the release of the sanitizing product 4 in gel form, with the slits being advantageously arranged at the bottom surface of the container body 2, i.e. the surface that is adapted to be directed toward the wall of the sanitary fixture to which the sanitizing device is applied.

**[0024]** The slits are adapted to allow the product in gel form 4 to be struck directly by streams of water of the sanitary fixture and a direct discharge of the resulting solution with gradual release of the sanitizing product.

**[0025]** Conveniently, the slits 5 are arranged so as to leave a central region 6 of the body of the container full, with the slits 5 extending laterally thereto.

**[0026]** This particular configuration of the slits 5 allows the container body 2 to be filled without the product in gel form 4 immediately leaking through the slits 5, as will be described in detail below.

**[0027]** Advantageously, it is possible to have, at the bottom surface of the container body 2, slits 5 that can also be continuous at the bottom of the container body 2, as long as they are provided in a certain dimension, as will be described in detail below.

**[0028]** An additional variation of the slits 5 provided at the bottom of the container body 2 entails that the slits widen as they extend upward with respect to the direction of pouring of the product in gel form, i.e. at the edge regions of the container body: in this case the slits widen in a region 7, arranged for example perpendicular to the extension of the slits.

**[0029]** The size of the slits is extremely important to ensure that upon pouring the product in gel form, which is to be loaded into the container body 2, the product does not exit from the slits proper.

**[0030]** In order to prevent such drawback, and therefore make it possible to provide a sanitizing device with a product in gel form loaded in it, the slits 5 can have various shapes and dimensions, with a size limit of 2 mm width.

**[0031]** Ultimately, the size limit indicated previously of 2 mm for the width of the slits 5 ensures that, upon pouring the product in gel form 4 into the body 2 of the container, the product does not exit from the slits proper.

**[0032]** To this end, the gel is conveniently heated and poured at a certain temperature so that it is at the same time pourable and as viscous as possible.

**[0033]** The heating temperature to which the gel is heated must be such that at the moment of pouring the gel has a minimum viscosity of 500 mPa\*s.

**[0034]** In substance, what is required is to have a heating temperature of the gel such that the gel can have a viscosity that enables it to not leak through the slits 5 once it is loaded into the container body 2.

**[0035]** The actual filling temperature of the container body varies depending on the composition of the gel. For example aqueous gels containing ethoxylated alcohols can require, for pouring, temperatures comprised between 75° and 80°C; for other gels temperatures lower than 60°C can suffice. The important factor is that the gel is poured into the cage at a viscosity that is higher than 500 mPa\*s or even more preferably even higher, between 800 and 1200 mPa\*s.

**[0036]** For this type of tablet, the use of ringing gels like the ones described in EP 0598335 can be advantageous.

**[0037]** The maximum width of 2 mm specified for the slits 5 makes it possible for the gel not to leak, as mentioned, upon the loading thereof into the container body 2, but at the same time it makes it possible to ensure the functionality, i.e. the passage of the water once the tablet in gel form is in use.

**[0038]** The method of pouring the gel into the container body 2 can also optionally entail, in addition to the heating of the gel indicated above, the contrivance of pouring the gel initially at a region where there are no slits or there are slits of very reduced thickness, so as to give time for

the gel to constitute a certain mass such that it has greater difficulty in exiting from the slits once the mass of gel reaches the region where the slits are arranged.

**[0039]** In the embodiment in which the slits 5 are interrupted at a region defined on the bottom surface of the container body 2, it is advisable to pour the gel exactly in such region that is substantially free from slits 5, and therefore enable the mass of gel to then flow toward the region of the slits once the gel has created a mass that is such as to prevent the product in gel form from leaking through the slits 5 proper.

**[0040]** In the embodiment in which the slits 5 widen at a widened portion of slot 7, the portion 7 of slot will have a maximum size that can even exceed the 2 mm maximum indicated previously, as the portion 7 of slot is in a region of the container body 2 at its edges, a region that is reached by the mass of gel loaded in the container body 2 when such mass is no longer capable of flowing through the slits, even if the slits 5 have a size greater than 2 mm.

**[0041]** The viscosity of the gel during the filling must preferably be approximately 800-1200 mPa\*s measured with a Haake viscometer VT550 MV2 at 5s-1.

**[0042]** This value is a indicative, and non-limiting, of the preferred viscosity of the gel.

**[0043]** What is extremely important is that, during the step of pouring, the gel must initially encounter a surface that is locally closed or provided with slots of dimensions reduced sufficiently to prevent the exit of gel, in order to later progressively fill the containment device also at the slits 5.

**[0044]** In practice it has been found that the sanitizing device according to the present invention and the corresponding filling method achieve the intended aim and objects.

**[0045]** In fact, the device according to the invention makes it possible to be loaded with a tablet made with a product in gel form, with the product in gel form being loaded in the container body of the sanitizing device without the product in gel form exiting from the slits for releasing the product during loading.

**[0046]** This is due both to a particular choice of the maximum width dimension of the slits and to a particular choice of the method of loading the product in gel form, which entails that the loading occurs initially on very thin slits or in a region substantially free from slits in order to then make the mass of gel flow to the other regions of the container (cage) when the mass is significant and no longer capable of leaking through the slits proper.

**[0047]** The use of gel inside a device of the type shown makes it possible to overcome the problems of the background art with regard to the use of solid sanitizing tablets, and the problems associated with the use of liquid tablets that require a completely closed container, and also the problems associated with the use of gel applied directly on a wall of the sanitary fixture.

**[0048]** In fact, the characteristics of the gel make it possible to provide containment devices that are open or

partially open, by taking advantage of the viscosity characteristics of the gel that enable its stable permanence inside a perforated container, even under the effect of streams of water. In the same way, the convenience remains unaltered of application to the sanitary fixture of a device of the cage type, which does not require particular dexterity or the need to come into contact with the internal wall of the sanitary fixture in order to directly apply a dose of gel.

**[0049]** The device and the method, thus conceived, are susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

**[0050]** Moreover, all the details may be substituted by other, technically equivalent elements.

**[0051]** In particular, the person skilled in the art will understand without effort that the shape of the container body, as well as the dimensions and the shapes of the slits, can be many according to the method of filling adopted and depending on the composition of the gel. For example, it is possible to have a shape of the container body with inner walls arranged in a labyrinth-like configuration, such that the gel is poured at these walls and reaches a sufficiently solid state before arriving proximate to the slits necessary for the passage of water.

**[0052]** Figure 12 shows a fourth embodiment of the device according to the invention, in which the container body 2 is provided, at the upper surface thereof, which is adapted to be directed toward the opening of the sanitary fixture, with a plurality of walls 10 that are arranged in a labyrinth-like configuration and are mutually offset. In this case the container body has a boat-like shape and the walls 10 are vertical vanes.

**[0053]** Figure 13 shows a fifth embodiment of the device according to the invention, similar to the one in Figure 12, with the walls 10 provided with holes 11 or with slits 12.

**[0054]** Figure 14 shows a sixth embodiment of the device according to the invention, similar to the ones in Figures 12 and 13, in which the slits 5 defined on the container body 2 have a different orientation.

**[0055]** In practice, the materials used, as well as the contingent shapes and dimensions, may be any according to the requirements and the state of the art.

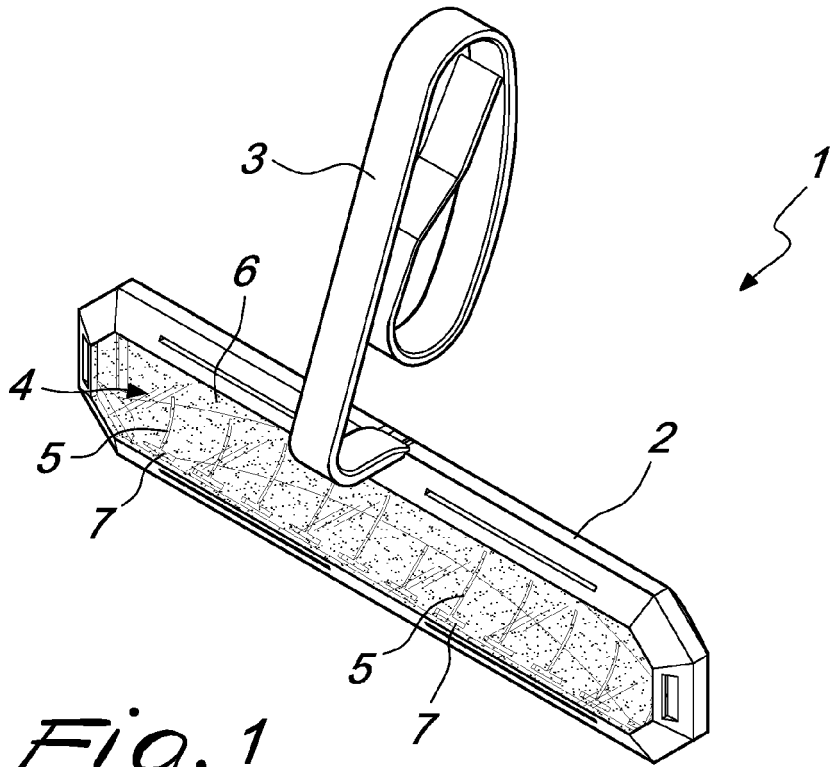
**[0056]** The disclosures in Italian Patent Application No. 102016000049687 (UA2016A003445) from which this application claims priority are incorporated herein by reference.

**[0057]** Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

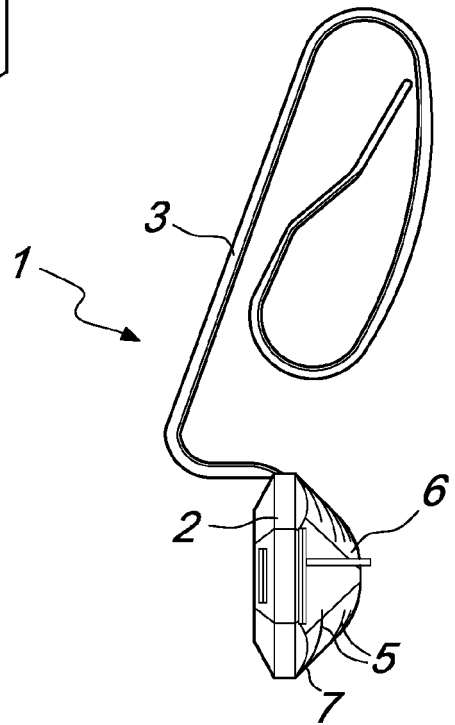
**Claims**

1. A sanitizing device (1), particularly for sanitary fixtures and the like, which comprises an open container body (2) that is adapted to accommodate a sanitizing product (4), and a stem (3) adapted to enable the clipping of said device to a sanitary fixture, **characterized in that** said container body (2) accommodates a sanitizing product in gel form that is adapted to be released gradually by said container body as a consequence of the passage of water through said container body (2). 5  
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2. The device according to claim 1, **characterized in that** said container body (2) is affected by slits (5) that are adapted to allow said gel to be struck directly by streams of water of the sanitary fixture and a direct discharge of the resulting solution with gradual release of said sanitizing product (4), said slits (5) having a maximum width that is such as to prevent the exit of the product in gel form (4) upon the loading of said product in gel form (4) into said container body (2). 15  
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3. The device according to claim 1 or 2, **characterized in that** said slits (5) have a maximum width of 2 mm. 25
4. The device according to one or more of the preceding claims, **characterized in that** said slits (5) are defined at the bottom surface of said container body (2). 30
5. The device according to one or more of the preceding claims, **characterized in that** said slits (5) are defined at the bottom surface of said container body, with a discontinuity at a central region (6) thereof. 35
6. The device according to one or more of the preceding claims, **characterized in that** the slits (5) widen at the edges of said container body (2). 40
7. The device according to one or more of the preceding claims, **characterized in that** said product in gel form (4) has a minimum viscosity at 20°C of 50 Pa\*s.
8. The device according to one or more of the preceding claims, **characterized in that** said stem (3) is at an angle with respect to a front surface of said container body (2) that lies opposite said rear surface. 45
9. The device according to one or more of the preceding claims, **characterized in that** said stem (3) is aligned with respect to a front surface of said container body (2) that lies opposite said rear surface. 50
10. The device according to one or more of the preceding claims, **characterized in that** said container body (2) is provided, at an upper surface thereof that is adapted to be directed toward the opening of the

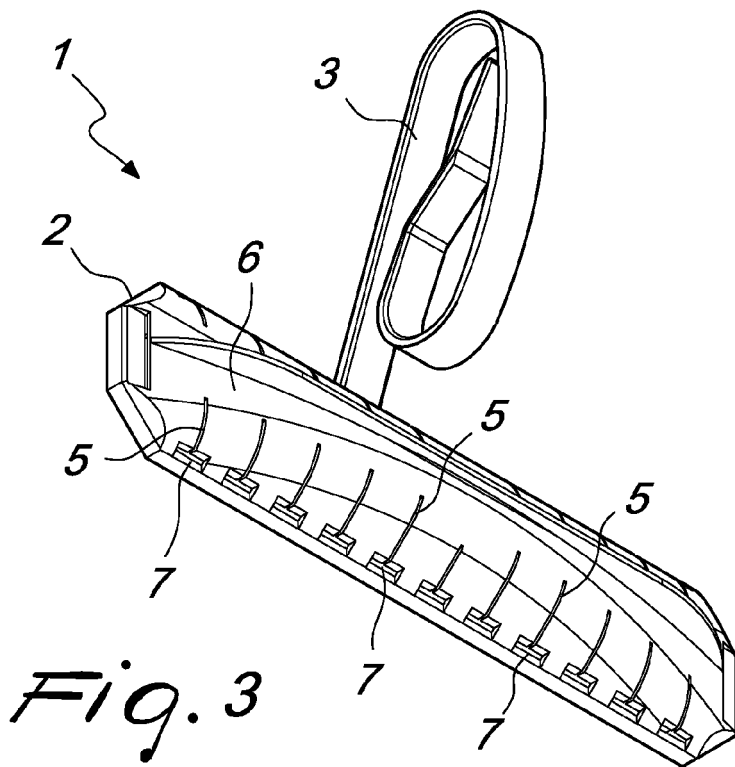
sanitary fixture, with a plurality of walls (10) that are arranged in a labyrinth-like configuration and are mutually offset.



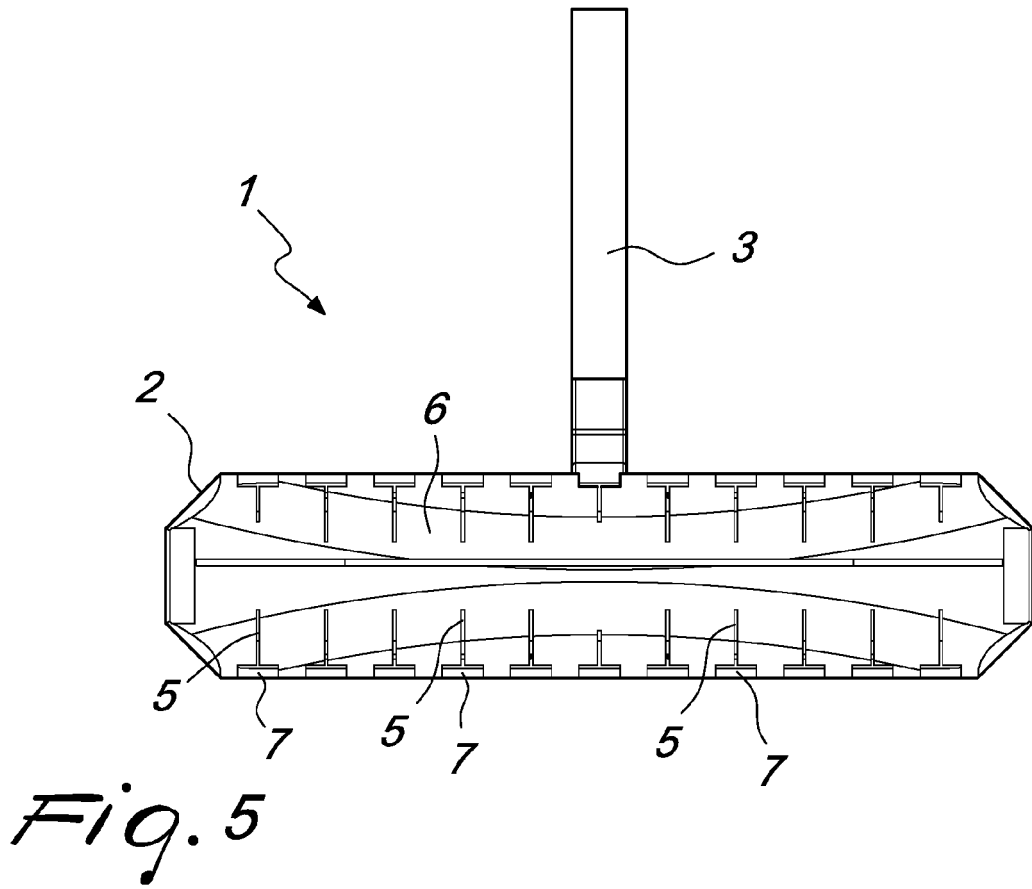
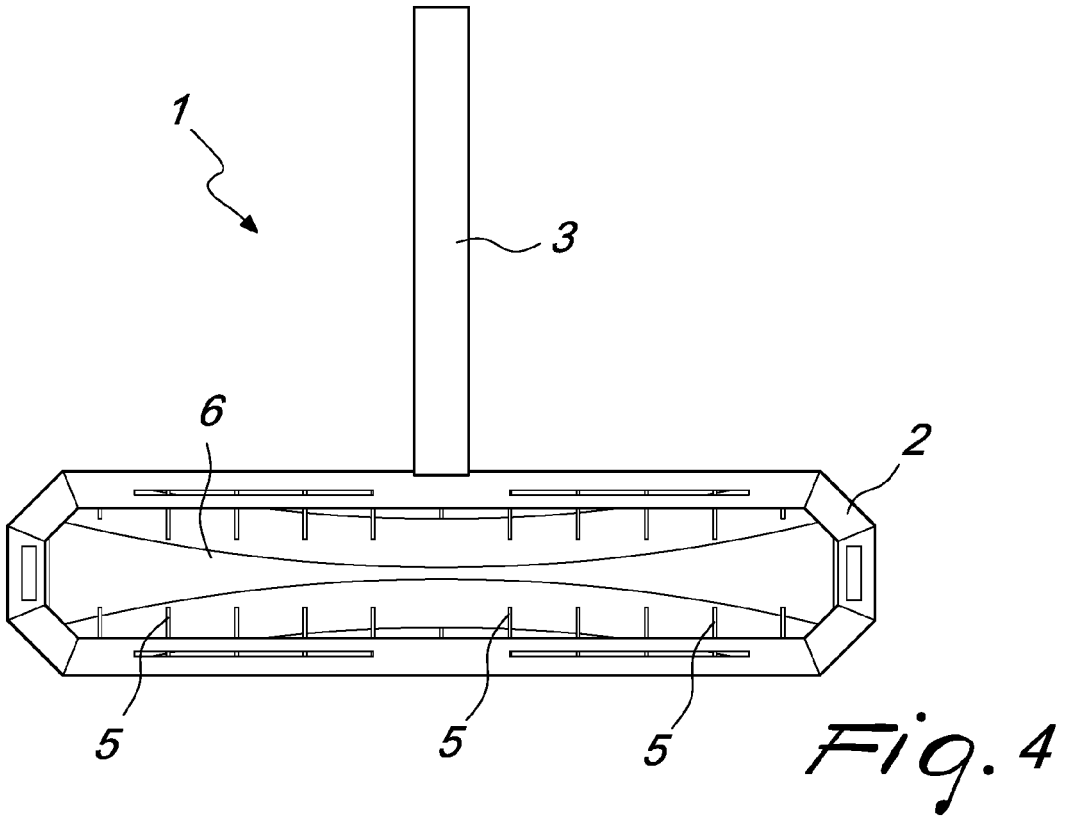
*Fig. 1*

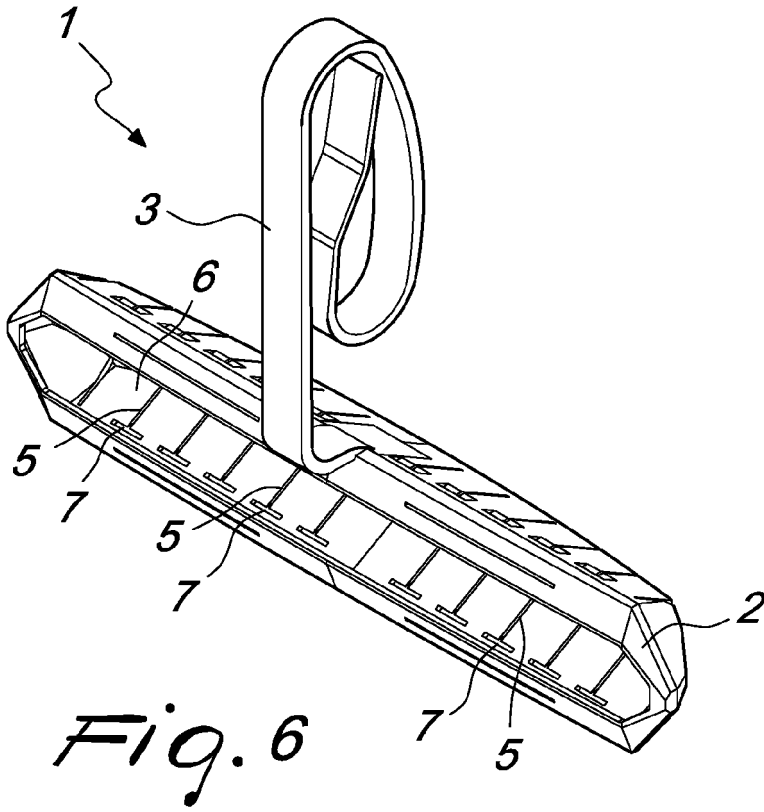


*Fig. 2*

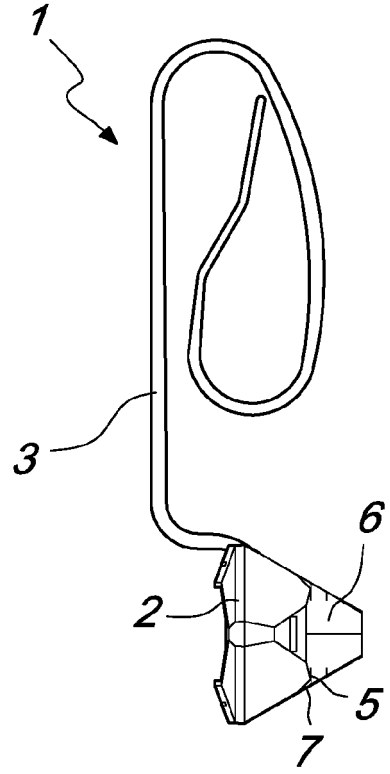


*Fig. 3*

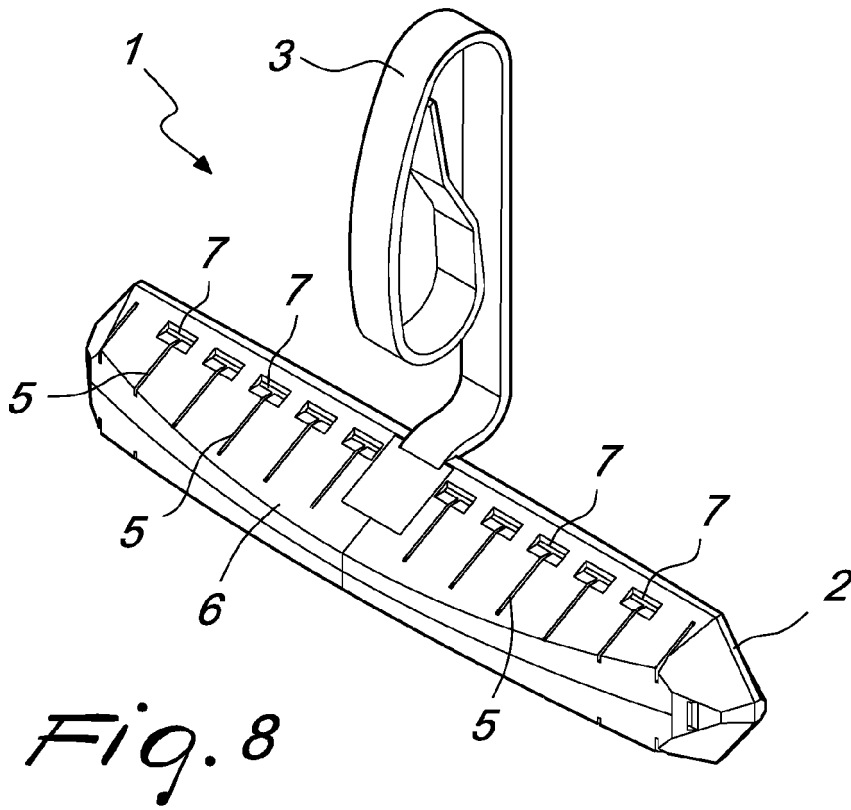




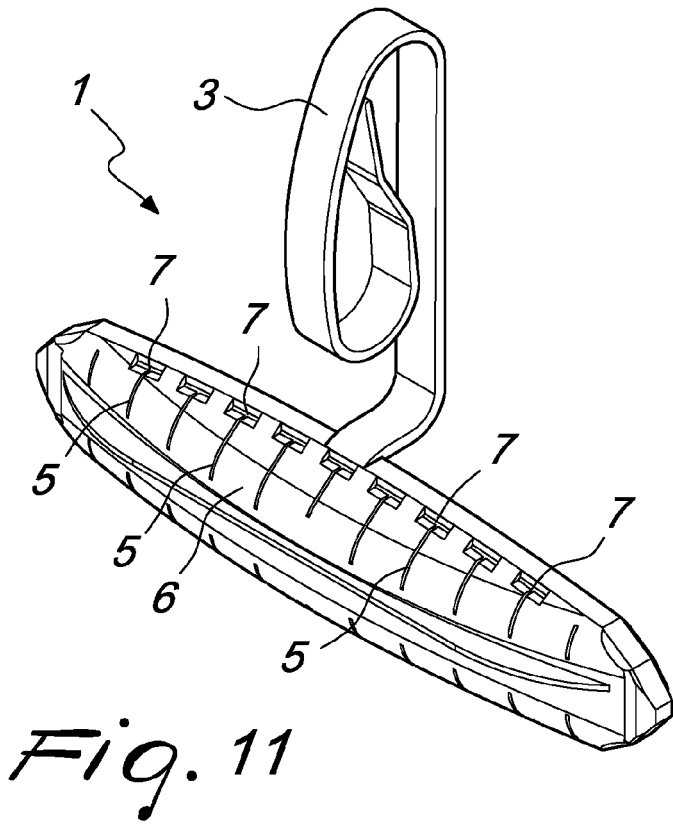
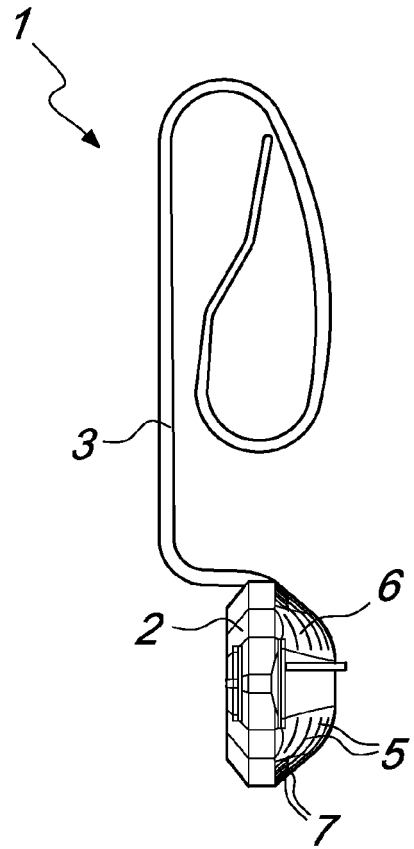
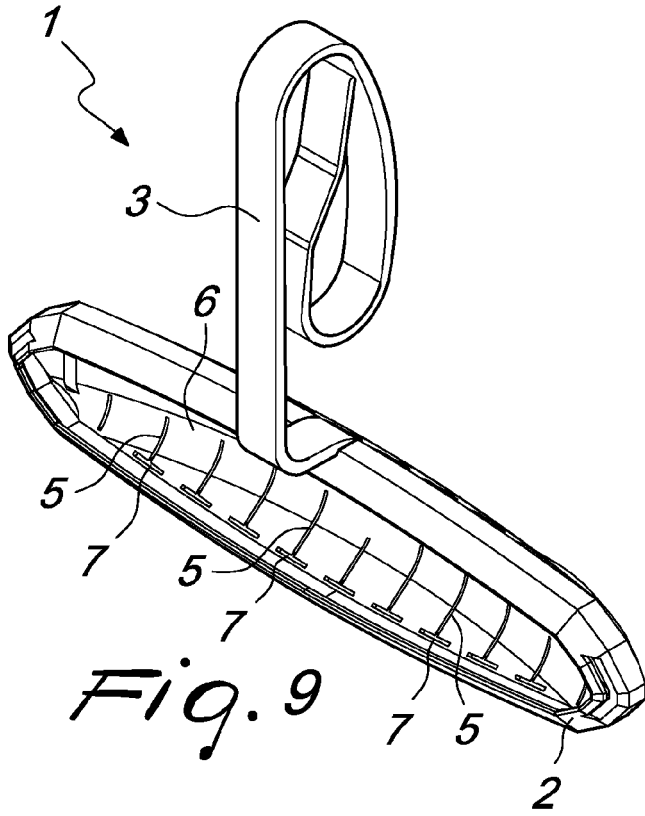
*Fig. 6*

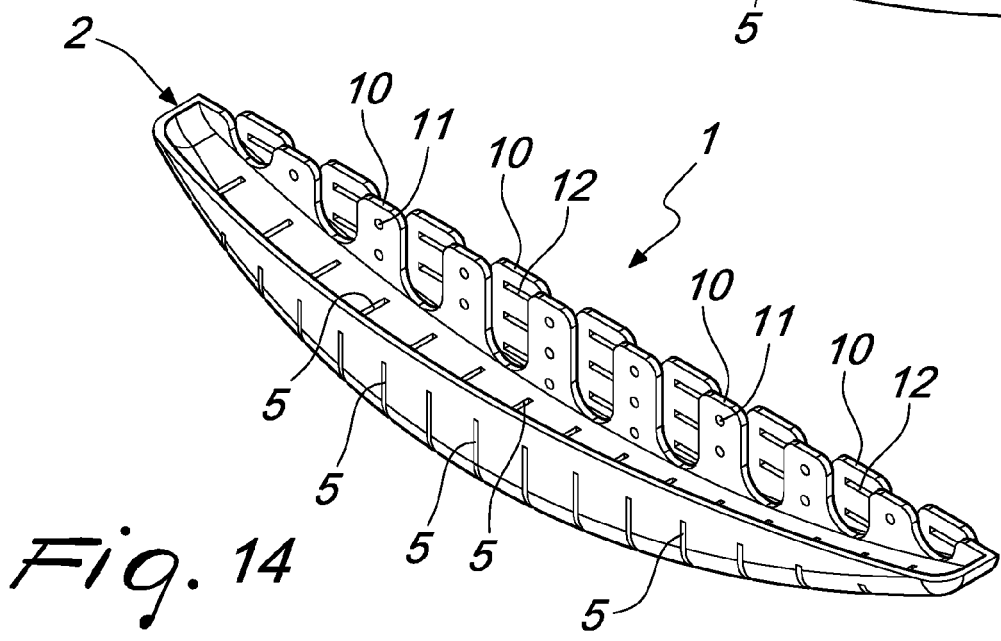
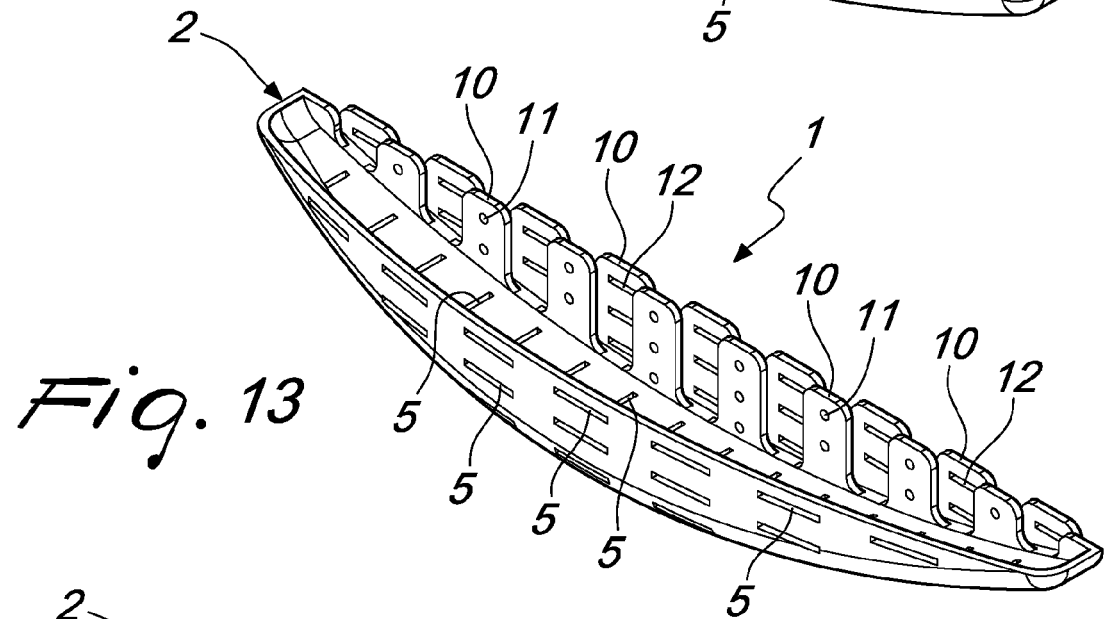
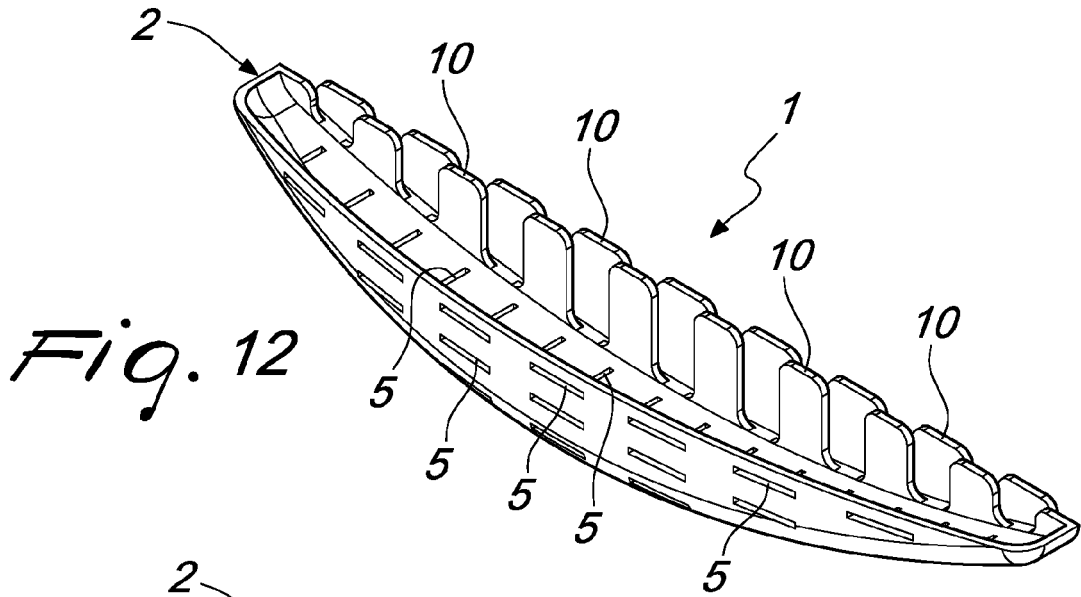


*Fig. 7*



*Fig. 8*







EUROPEAN SEARCH REPORT

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EP 17 17 1066

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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			

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