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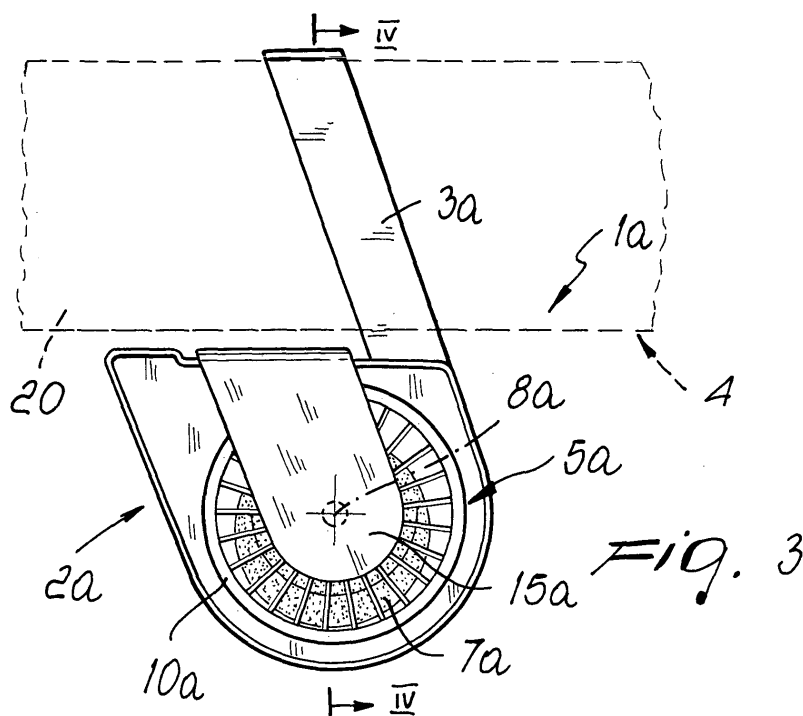
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Remarks:  
Amended claims in accordance with Rule 86 (2) EPC.

(54) **Device for dispensing active components packaged in a tablet or bar in toilet bowls or water-using sanitary fixtures in general**

(57) A device for dispensing, in toilet bowls or water-using sanitary fixtures in general, active components packaged in a tablet or bar. The device (1a) comprises a supporting structure (2a) that is provided with engagement means (3a) that can engage the sanitary fixture (4) in order to support the supporting structure (2a) in a region of the fixture that is affected by the flow of flushing

water. The device (1a) comprises a rotating element (5a) that forms internally a receptacle (6a) that is connected to the outside and is adapted to contain a water-soluble tablet (7a) or bar. The rotating element (5a) is supported so that it can rotate about a rotation axis (8a) by the supporting structure (2a) and can rotate about the rotation axis (8a) with respect to the supporting structure (2a) due to the flow of the flushing water of the sanitary fixture (4).



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## Description

**[0001]** The present invention relates to a device for dispensing, in toilet bowls or water-using sanitary fixtures in general, active components packaged in a tablet or bar.

**[0002]** Devices for dispensing in toilet bowls active components, such as for example detergent and/or sanitizing and/or deodorant substances, packaged in a water-soluble tablet or bar, are known. These devices are generally constituted by a supporting structure, which is composed of an enclosure with a cage-like structure that forms internally a receptacle for the tablet or bar and with a hook-shaped arm for hanging, which is connected to the enclosure and can engage the rim of the toilet bowl so as to support the enclosure below the rim of the toilet bowl, where the holes for dispensing the flushing water of the toilet bowl are provided. In this manner, every time the flushing system of the toilet bowl is operated, the flushing water strikes the enclosure, gradually dissolving the tablet or bar and therefore mixing the detergent and/or sanitizing and/or deodorant substances with the flushing water.

**[0003]** In using these devices, very often one finds uneven wear of the tablet or bar, since the flushing water strikes differently the various regions of the tablet or bar. This uneven wear very often causes unwanted breakup of the tablet or bar, releasing undissolved pieces into the flushing water, therefore causing a scarcely effective consumption of the tablet or bar in terms of cleaning the toilet bowl.

**[0004]** Moreover, with these devices the substances that compose the tablet or bar dissolve in the flushing water in a scarcely satisfactory manner and foam generation is limited and is usually enhanced by resorting to an increase in surfactant content in the substances that compose the tablet or bar.

**[0005]** The aim of the present invention is to provide a device for dispensing, in toilet bowls or water-using sanitary fixtures in general, active components packaged in a tablet or bar that achieves uniform consumption of the tablet or bar and an improved solution and/or mixing of the substances that compose the tablet or bar in the flushing water.

**[0006]** Within this aim, an object of the invention is to provide a device that for an equal composition of the tablet or bar achieves a greater generation of foam and a longer retention of the generated foam with respect to known types of devices.

**[0007]** Another object of the invention is to provide a device that is structurally simple and can be manufactured at competitive costs.

**[0008]** Another object of the invention is to provide a device that can be used like known types of devices that use solid tablets or bars.

**[0009]** This aim and these and other objects that will become better apparent hereinafter are achieved by a device for dispensing, in toilet bowls or water-using sanitary fixtures in general, active components packaged in

a tablet or bar, comprising a supporting structure that is provided with engagement means that can engage the sanitary fixture in order to support the supporting structure in a region of the fixture that is affected by the flow of flushing water, characterized in that it comprises a rotating element that forms internally a receptacle that is connected to the outside and is adapted to accommodate a water-soluble tablet or bar, said rotating element being supported so that it can rotate about a rotation axis by said supporting structure and being able to rotate about said rotation axis with respect to said supporting structure due to the flow of the flushing water of the sanitary fixture.

**[0010]** Further characteristics and advantages of the invention will become better apparent from the description of two preferred but not exclusive embodiments of the device according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a perspective view of the device according to the invention in a first embodiment, hung from the rim of a toilet bowl;

Figure 2 is an exploded perspective view of the device according to the invention in the first embodiment;

Figure 3 is a view of the device according to the invention, in the first embodiment, taken from the side that is designed to face the wall of the toilet bowl;

Figure 4 is a schematic sectional view of Figure 3, taken along the line IV-IV;

Figure 5 is a perspective view of the device according to the invention in a second embodiment, hung from the rim of a toilet bowl;

Figure 6 is an exploded perspective view of the device according to the invention in the second embodiment;

Figure 7 is a view of the device according to the invention in the second embodiment, taken from the side that is designed to face the wall of the toilet bowl;

Figure 8 is a sectional view of Figure 7, taken along the line VIII-VIII.

**[0011]** With reference to the figures, the device according to the invention, generally designated in its two embodiments by the reference numerals 1a and 1b, comprises a supporting structure 2a and 2b, which is provided with engagement means 3a and 3b, which can engage the water-using sanitary fixture 4 in order to support the supporting structure 3a and 3b in a region of the fixture 4 that is affected by the flow of flushing water.

**[0012]** According to the invention, the device comprises a rotating element 5a and 5b, which forms internally a receptacle 6a and 6b that is connected to the outside and is adapted to accommodate a tablet 7a or a bar 7b that is water-soluble and contains active components, such as for example detergent and/or sanitizing and/or deodorant substances. The rotating element 5a and 5b is supported, so that it can rotate about a rotation axis

8a and 8b, by the supporting structure 2a and 2b, and can rotate about said rotation axis 8a and 8b with respect to the supporting structure 2a and 2b by virtue of the flow of the flushing water of the sanitary fixture 4, as will become better apparent hereinafter.

**[0013]** The rotating element 5a and 5b preferably has a cage-like structure, so as to expose the tablet 7a or the bar 7b contained therein to the action of the flushing water.

**[0014]** Moreover, the rotating element 5a and 5b is preferably detachably associated with the supporting structure 2a and 2b, so that it can be removed from it when the tablet 7a or bar 7b is used up, in order to be replaced with another rotating element 5a and 5b that supports a new tablet 7a or bar 7b, or in order to allow the insertion therein of a new tablet 7a or bar 7b.

**[0015]** In this last case, the rotating element 5a and 5b is provided in at least two parts 9a, 10a, 9b, 10b, which are detachably associated to each other indeed to allow the insertion of a water-soluble tablet 7a or bar 7b in the cage-like structure that constitutes the rotating element 5a and 5b.

**[0016]** More particularly, the rotating element 5a of the device in its first embodiment has a substantially cylindrical shape, which resembles a windmill wheel, in which the axis coincides with the rotation axis 8a and the lateral surface is constituted by vane-like fins.

**[0017]** The rotating element 5a is formed in two parts: a first part 9a, which is constituted by one of the flat faces and by the lateral surface of the wheel, and a second part 10a, which is constituted by the other flat face of the wheel. The two parts 9a, 10a are detachably coupled to each other, for example by means of a coupling of the interlocking type, as shown, or of the bayonet type or threaded type or other detachable coupling of a known type.

**[0018]** The first part 9a and the second part 10a of the rotating element 5a are provided, at the rotation axis 8a, with two coaxial pivots 11a, 12a, which protrude from the two bases of the rotating element 5a and can engage rotatably within receptacles 13a, 14a provided in the supporting structure 2a.

**[0019]** The supporting structure 2a has a box-like shape, which is open on its side designed to be struck by the stream of flushing water of the sanitary fixture 4.

**[0020]** The supporting structure 2a can also be provided in two parts that are detachably associated with each other, for example by means of a coupling of the interlocking type or of another detachable coupling of a known type, in order to allow the removable insertion of the rotating element 5a with its pivots 11a, 12a in the receptacles 13a, 14a; or, as shown, it can be provided with a portion 15a, which supports the receptacle 14a, that is constituted by an elastically flexible fin in order to allow detachable coupling of the rotating element 5a with its pivots 11a, 12a in the receptacles 13a, 14a.

**[0021]** In the second embodiment, the rotating element 5b has a substantially cylindrical shape that resembles

a squirrel cage, in which the axis coincides with the rotation axis 8b and the lateral surface is constituted by fins, which can be arranged along radial planes that pass through the axis 8b, as shown, or can be advantageously shaped like cylindrical spirals that lie around the axis 8b.

**[0022]** In this second embodiment also, the rotating element 5b is formed in two parts: a first part 9b, which is constituted by one of the flat faces and by one half of the lateral surface of the rotating element 5b, and a second part 10b, which is constituted by the other flat face and by the other half of the lateral surface of the rotating element 5b. The two parts 9b, 10b are detachably coupled to each other, for example by means of a coupling of the interlocking type, as shown, or of the bayonet or threaded or other known type of detachable coupling.

**[0023]** The first part 9b and the second part 10b of the rotating element 5b have, at the rotation axis 8b, two coaxial pivots 11b and 12b, which protrude from the two end faces of the rotating element 5b and can engage rotatably within receptacles 13b, 14b provided on two mutually opposite walls 17b, 18b of the supporting structure 2b.

**[0024]** The supporting structure 2b has a box-like configuration, which is open on its side that is designed to be struck by the stream of flushing water of the sanitary fixture 4.

**[0025]** The supporting structure 2b is provided with two mutually opposite walls 17b, 18b, in which the receptacles 13b, 14b for the pivots 11b, 12b are formed; such receptacles are provided as slots that are open toward the open side of the supporting structure 2b and are closed at the opposite side in order to allow the insertion or extraction of the pivots 11b, 12b. The receptacles 13a, 14b are conveniently inclined downwardly, toward their closed end, so as to effectively prevent the rotating element 5b from being able to disengage from the supporting structure 2b when it is struck by the stream of water.

**[0026]** In both embodiments, the supporting structure 2a, 2b has, on its side that is designed to remain exposed when the device is arranged in the sanitary fixture 4, openings 19a and 19b to allow viewing of the rotating element 5a and 5b from the outside.

**[0027]** The engagement means 3a and 3b are constituted by a tab of the supporting structure 2a and 2b, which is shaped like a hook and can engage the rim 20 of the toilet bowl or sanitary fixture 4. Said tab is preferably provided monolithically with the remaining part of the supporting structure 2a and 2b or with one of the parts that compose the supporting structure.

**[0028]** In both embodiments, the supporting structure 2a and 2b and the rotating element 5a and 5b are preferably made of molded synthetic material.

**[0029]** In the first embodiment, the rotating element 5a is arranged in the supporting structure 2a so that when the device is applied to the toilet bowl or sanitary fixture 4, its rotation axis 8a is orientated substantially at right angles to the wall 21 of the toilet bowl or of the sanitary fixture 4 against which the supporting structure 2a is

hung, while in the second embodiment the rotating element 5b is arranged in the structure 2b so that its rotation axis 8b is substantially parallel to the wall 21.

[0030] Operation of the device according to the invention is as follows.

[0031] With the device hung from the rim of the toilet bowl or sanitary fixture 4 so that it is affected by the stream of flushing water, every time the flushing system is operated, a stream of water enters the supporting structure 2a and 2b, striking the rotating element 5a and 5b. Owing to this impact and to the configuration and arrangement of the fins of the rotating element 5a and 5b, the stream of water, besides affecting the tablet 7a or bar 7b, gradually dissolving it, turns the rotating element 5a and 5b about the rotation axis 8a and 8b with respect to the supporting structure 2a and 2b. This rotation achieves uniform wear of the tablet 7a or bar 7b and facilitates the dissolving and/or mixing of the substances that compose the tablet 7a or bar 7b in the flushing water, further generating considerable foam. The generated foam has finer and more compact bubbles and is more durable than the foam that can be obtained, for an equal composition of the tablet 7a or bar 7b, with known kinds of devices.

[0032] When the tablet 7a or bar 7b is used up, the device can be refilled with a new tablet 7a or bar 7b. The refilling of the device, depending on production and marketing requirements, may affect only the tablet 7a, 7b, as preferred and provided in the illustrated embodiments, or may also affect the rotating element 5a and 5b or the entire device.

[0033] In practice it has been observed that the device according to the invention fully achieves the intended aim, since it achieves uniform wear of the tablet or bar, improves the dissolving and/or mixing of the substances that compose the tablet or bar in the flushing water, and for an equal composition of the tablet or bar achieves greater generation of foam and longer retention of the generated foam than known devices.

[0034] Thanks to this fact it is possible to reduce the percentage of surfactants in the composition of the tablets or bars.

[0035] Another advantage of the device according to the invention is that it has a simple structure that can be manufactured at low cost.

[0036] In the examples of embodiments described above, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other exemplary embodiments. Moreover, it is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0037] The device thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the same inventive concept; all the details may further be replaced with other technically equivalent elements.

[0038] In practice, the materials used, as well as the

dimensions, may be any according to requirements and to the state of the art.

[0039] 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 device for dispensing, in toilet bowls or water-using sanitary fixtures in general, active components packaged in a tablet or bar, comprising a supporting structure that is provided with engagement means that can engage the sanitary fixture in order to support the supporting structure in a region of the fixture that is affected by the flow of flushing water, **characterized in that** it comprises a rotating element that forms internally a receptacle that is connected to the outside and is adapted to accommodate a water-soluble tablet or bar, said rotating element being supported so that it can rotate about a rotation axis by said supporting structure and being able to rotate about said rotation axis with respect to said supporting structure due to the flow of the flushing water of the sanitary fixture.
2. The device according to claim 1, **characterized in that** said rotating element is detachably associated with said supporting structure.
3. The device according to claim 1, **characterized in that** said rotating element has a cage-like structure that forms internally said receptacle for the water-soluble tablet or bar.
4. The device according to one or more of the preceding claims, **characterized in that** said rotating element is provided in at least two parts, which are detachably associated with each other in order to allow the insertion of said water-soluble tablet or bar in said cage-like structure.
5. The device according to one or more of the preceding claims, **characterized in that** said rotating element has a substantially cylindrical shape, said rotation axis coinciding with the axis of said rotating element.
6. The device according to one or more of the preceding claims, **characterized in that** said rotating element has vane-like fins on its lateral surface.
7. The device according to one or more of the preceding claims, **characterized in that** said rotating element has, on its lateral surface, fins that are shaped like

a cylindrical spiral and lie around said rotation axis.

8. The device according to one or more of the preceding claims, **characterized in that** said supporting structure has, on its side that is designed to remain exposed when the device is arranged in the sanitary fixture, openings to allow viewing of said rotating element from the outside. 5
9. The device according to one or more of the preceding claims, **characterized in that** said engagement means are constituted by a hook-shaped tab that can engage the rim of the toilet bowl or sanitary fixture. 10
10. The device according to one or more of the preceding claims, **characterized in that** said supporting structure and said rotating element are made of molded synthetic material. 15
11. The device according to one or more of the preceding claims, **characterized in that** said rotating element is arranged in said supporting structure in a manner adapted to achieve, when the device is hung against a wall of the toilet bowl or sanitary fixture, an arrangement of said rotation axis that is substantially perpendicular to said wall of the toilet bowl or sanitary fixture. 20
12. The device according to one or more of the preceding claims, **characterized in that** said rotating element is arranged in said supporting structure in a manner adapted to achieve, when the device is hung against a wall of the toilet bowl or sanitary fixture, an arrangement of said rotation axis that is substantially parallel to said wall of the toilet bowl or sanitary fixture. 25

#### Amended claims in accordance with Rule 86(2) EPC. 30

1. A device (1a;1b) for dispensing, in toilet bowls or water-using sanitary fixtures (4) in general, active components packaged in a tablet (7a) or bar (7b), comprising a supporting structure (2a;2b) that is provided with engagement means (3a;3b) that can engage the sanitary fixture (4) in order to support the supporting structure (2a;2b) in a region of the fixture (4) that is affected by the flow of flushing water, **characterized in that** it comprises a rotating element (5a;5b) that forms internally a receptacle (6a;6b) that is connected to the outside and is adapted to accommodate a water-soluble tablet (7a) or bar (7b), said rotating element (5a;5b) being supported so that it can rotate about a rotation axis (8a;8b) by said supporting structure (2a;2b) and being able to rotate about said rotation axis (8a;8b) with respect to said supporting structure (2a;2b) due to the flow of the flushing water of the sanitary fixture (4). 35

2. The device (1a;1b) according to claim 1, **characterized in that** said rotating element (5a;5b) is detachably associated with said supporting structure (2a;2b).

3. The device (1a; 1b) according to claim 1, **characterized in that** said rotating element (5a;5b) has a cage-like structure that forms internally said receptacle for the water-soluble tablet (7a) or bar (7b).

4. The device (1a; 1b) according to one or more of the preceding claims, **characterized in that** said rotating element (5a; 5b) is provided in at least two parts (9a,10a;9b,10b), which are detachably associated with each other in order to allow the insertion of said water-soluble tablet (7a) or bar (7b) in said cage-like structure.

5. The device (1a; 1b) according to one or more of the preceding claims, **characterized in that** said rotating element (5a;5b) has a substantially cylindrical shape, said rotation axis (8a;8b) coinciding with the axis of said rotating element (5a;5b).

6. The device (1a) according to one or more of the preceding claims, **characterized in that** said rotating element (5a) has vane-like fins on its lateral surface.

7. The device (1b) according to one or more of the preceding claims, **characterized in that** said rotating element (5b) has, on its lateral surface, fins that are shaped like a cylindrical spiral and lie around said rotation axis (8b).

8. The device (1a;1b) according to one or more of the preceding claims, **characterized in that** said supporting structure (2a;2b) has, on its side that is designed to remain exposed when the device (1a; 1b) is arranged in the sanitary fixture (4), openings (19a;19b) to allow viewing of said rotating element (5a;5b) from the outside, 40

9. The device (1a;1b) according to one or more of the preceding claims, **characterized in that** said engagement means (3a;3b) are constituted by a hook-shaped tab that can engage the rim (20) of the toilet bowl or sanitary fixture. 45

10. The device (1a;1b) according to one or more of the preceding claims, **characterized in that** said supporting structure (2a;2b) and said rotating element (5a;5b) are made of molded synthetic material.

11. The device (1a) according to one or more of the preceding claims, **characterized in that** said rotating element (5a) is arranged in said supporting structure (2a) in a manner adapted to achieve, when the

device (1a) is hung against a wall (21) of the toilet bowl or sanitary fixture (4), an arrangement of said rotation axis (8a) that is substantially perpendicular to said wall (21) of the toilet bowl or sanitary fixture (4).

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**12.** The device (1b) according to one or more of the preceding claims, **characterized in that** said rotating element (5b) is arranged in said supporting structure (2b) in a manner adapted to achieve, when the device (1b) is hung against a wall (21) of the toilet bowl or sanitary fixture (4), an arrangement of said rotation axis (8b) that is substantially parallel to said wall (21) of the toilet bowl or sanitary fixture (4).

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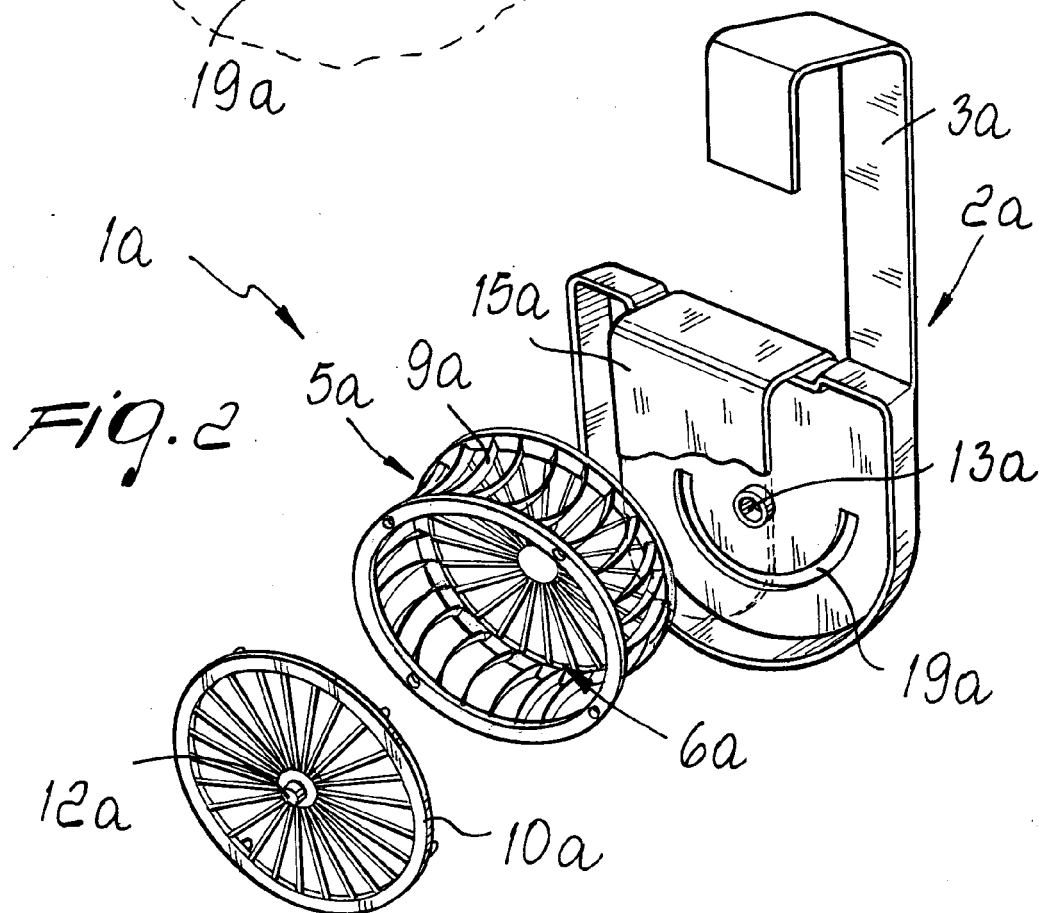
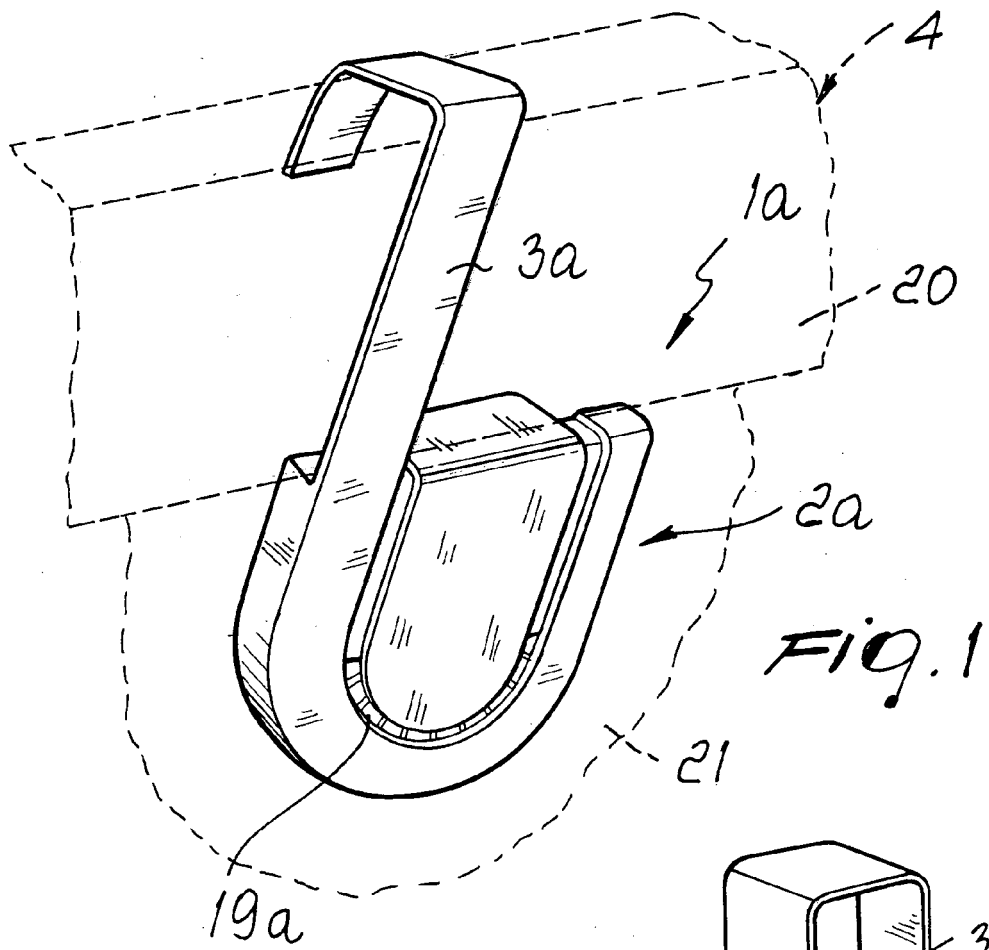
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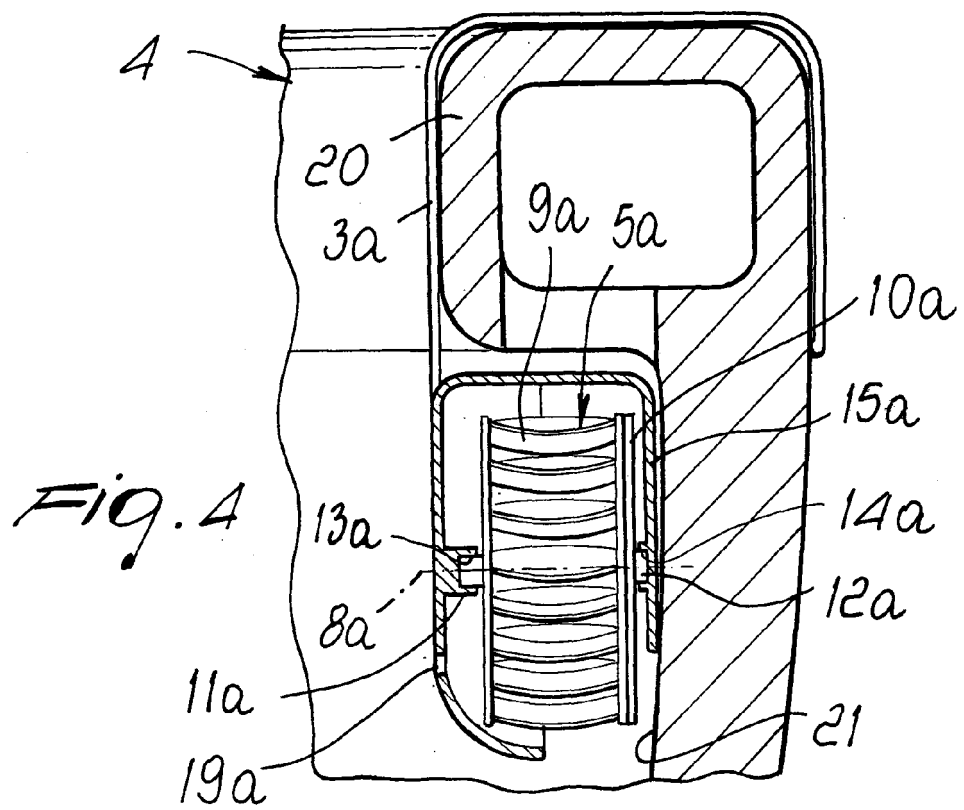
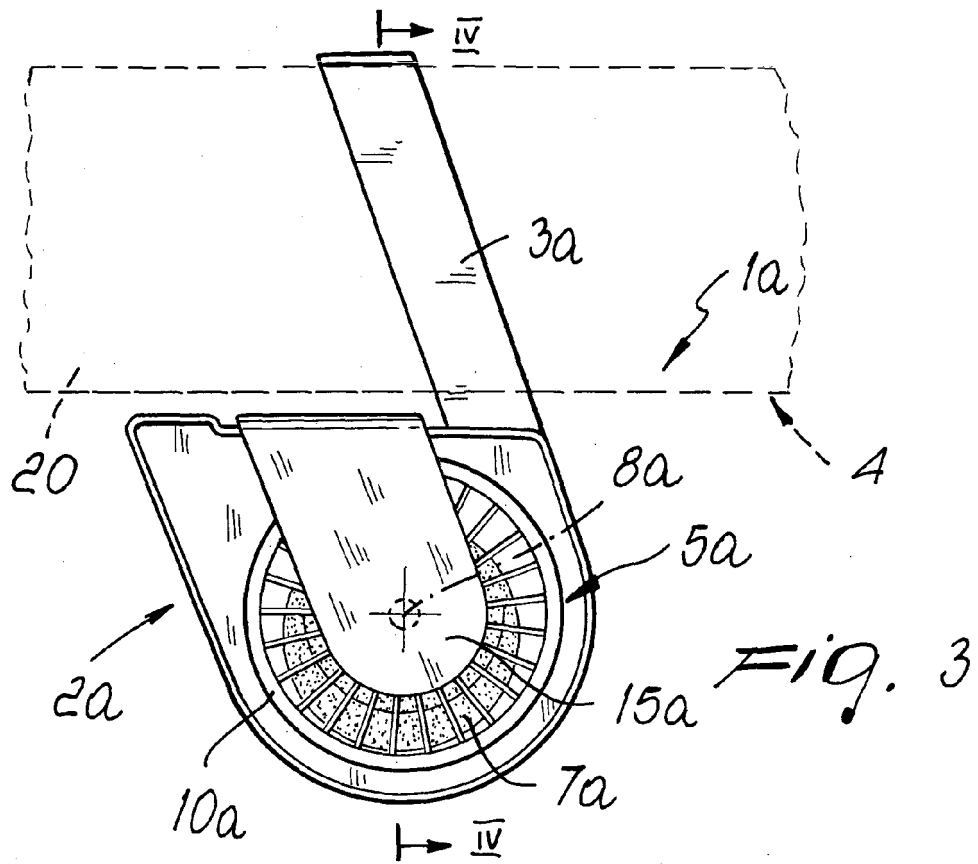
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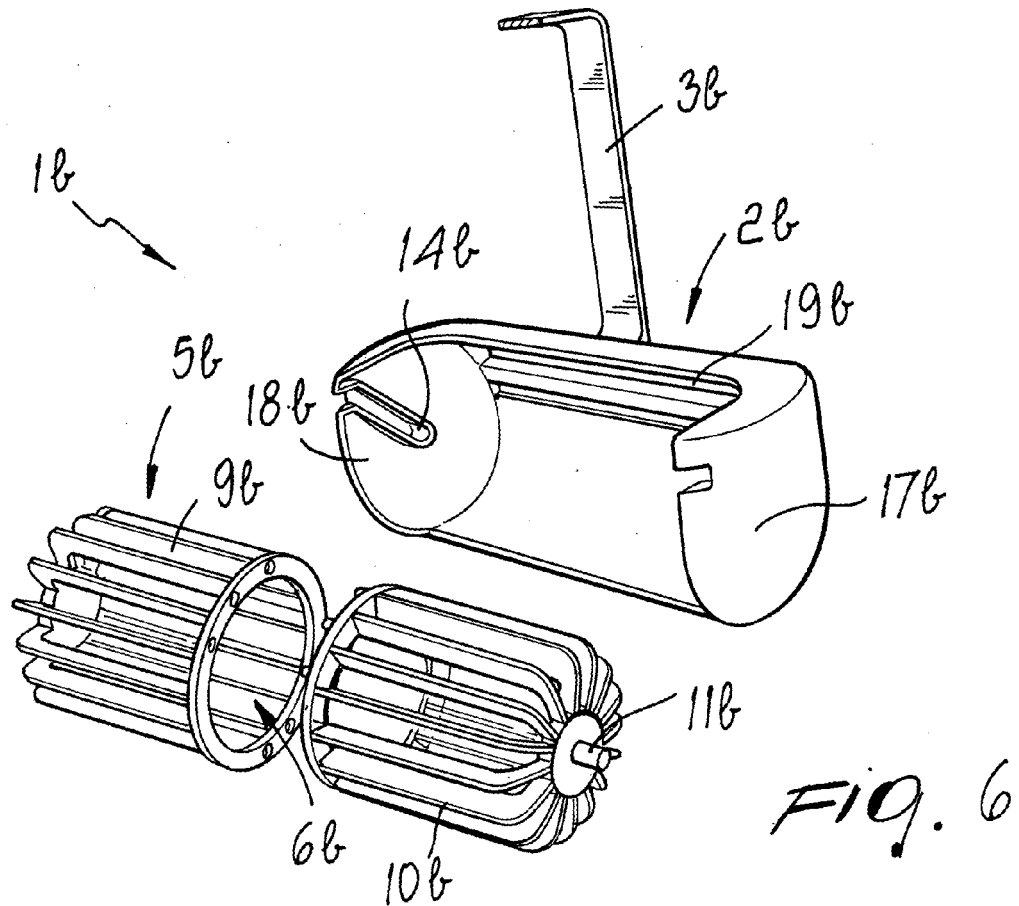


FIG. 6

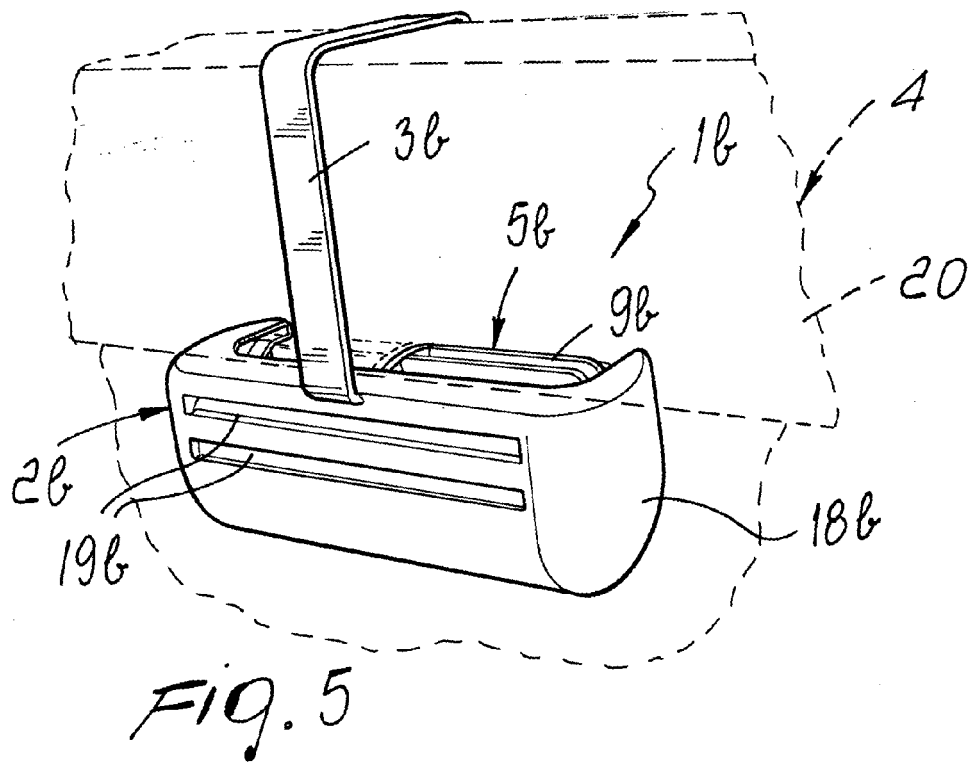
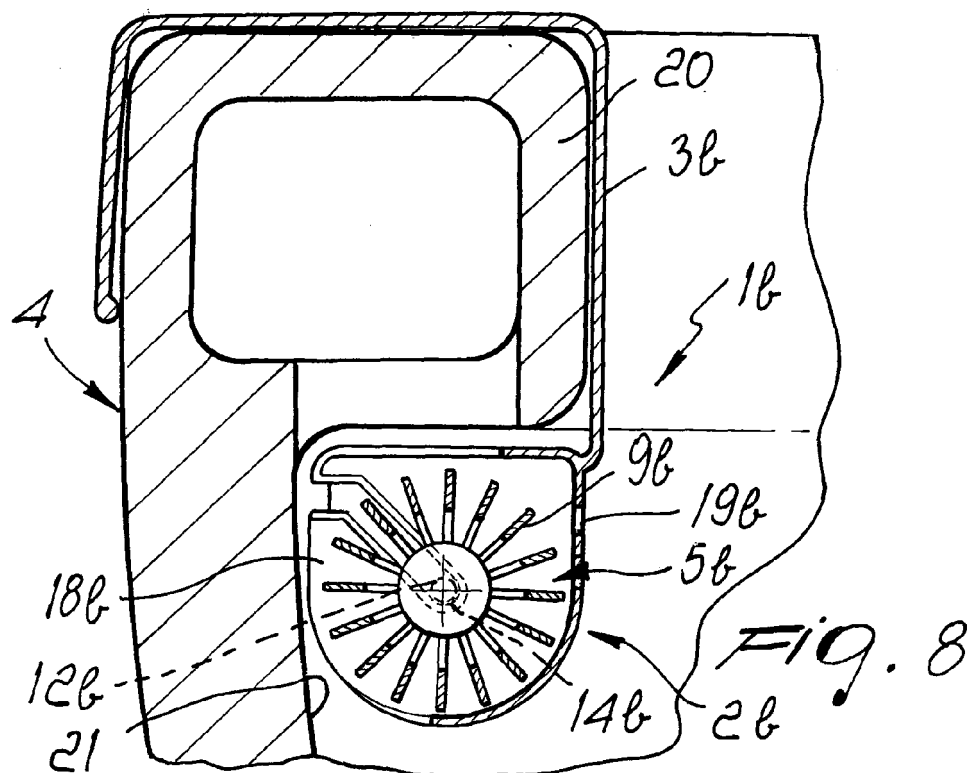
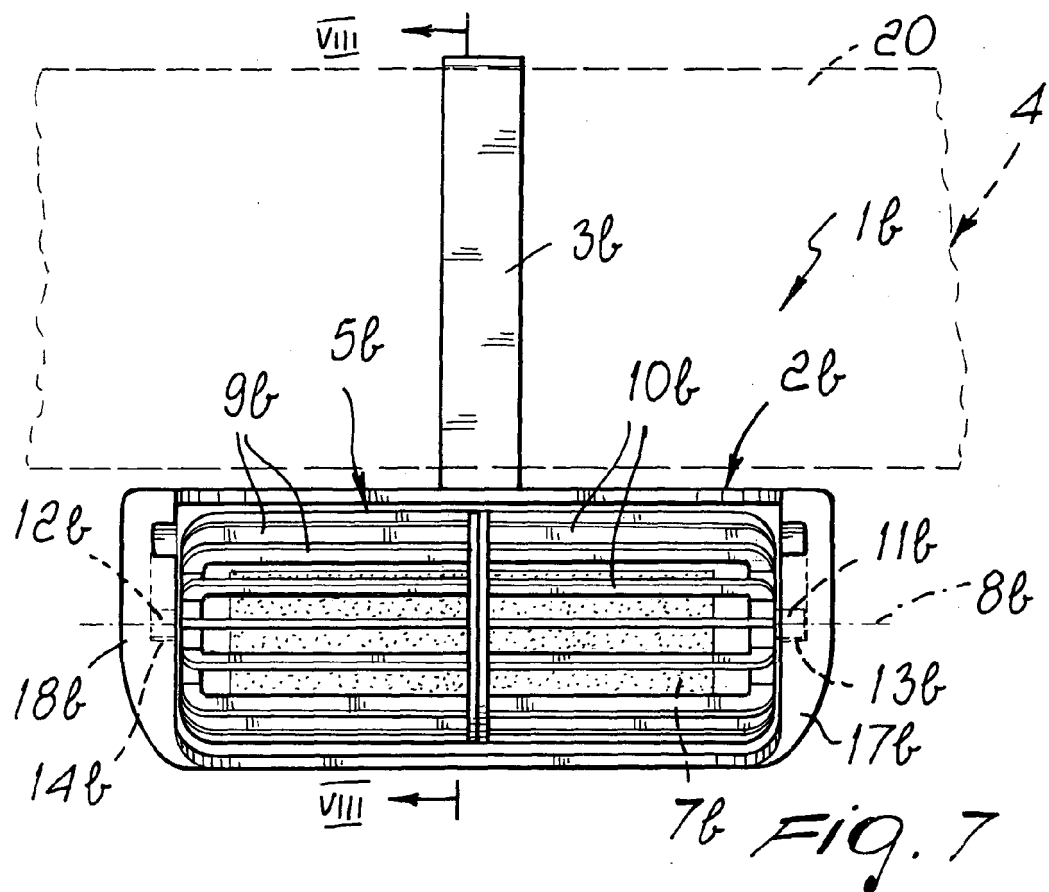


FIG. 5





European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 04 42 5941

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<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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 &amp; : member of the same patent family, corresponding document</p>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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