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(54) **Cageless support for a toilet bowl cleaning block**

(57) A cageless support (10) for a toilet bowl cleaning block, the cageless support (10) comprising a body (12) adapted to be suspended in a toilet bowl and comprising a plate (26), and a tab (28) projecting from the plate (26), the tab (28) being adapted to project into a toilet bowl cleaning block for holding said toilet bowl cleaning block in the water flush path when said body (12) of the cageless support (10) is suspended in the toilet bowl, so that the plate extends between the toilet bowl cleaning block and the toilet bowl wall. The tab may have different shapes, i.e. crown or teeth.

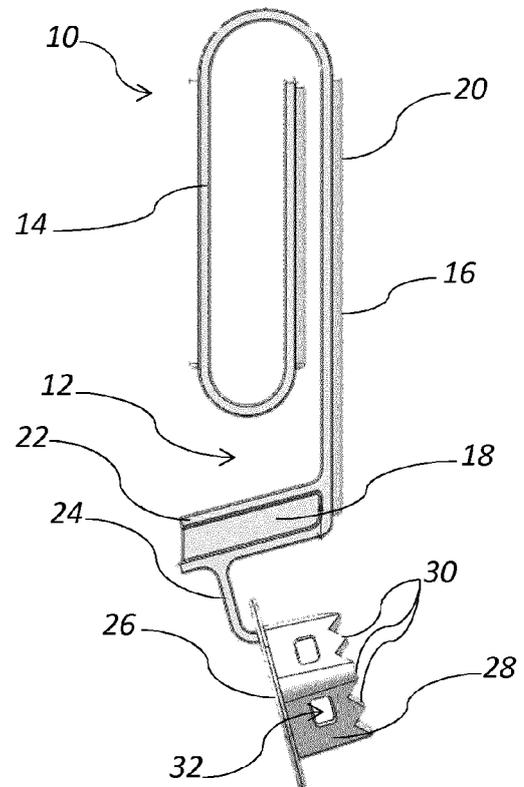


Figure 2

Description

[0001] The present invention relates to a cageless support for a toilet bowl cleaning block or solid block. The present invention also relates to a toilet bowl cleaning device, to a set for forming a toilet bowl cleaning device as well as to a method for producing a toilet bowl cleaning device.

[0002] More specifically, the invention refers to the field of the cageless toilet bowl cleaning devices adapted to be suspended in a toilet bowl.

[0003] Such cleaning devices are for example known from EP-A-1 907 638, EP-A-1 963 475, EP-A-1 996 691 or WO-A-2007/148054. All these documents describe cageless supports for toilet bowl cleaning blocks. These supports comprise a hook for hanging the support to the toilet bowl rim, an end of these supports being coated or embedded by the toilet bowl cleaning block during the device fabrication process. This solution implies that the toilet bowl cleaning block covers both sides of an end of the support. Thus, the toilet bowl cleaning block easily sticks to the toilet bowl wall and makes it dirty. Moreover, back side of the toilet bowl cleaning block (the one which faces the toilet bowl wall) is dissolved very quickly in a first step. This increases the risk that the toilet bowl cleaning block falls prematurely.

[0004] EP-A-2 191 077 discloses a cageless support adapted to hold several toilet bowl cleaning blocks.

[0005] US-A-3 947 901 describes a cageless support with two stems pressed or molded in the toilet bowl cleaning block.

[0006] Finally WO-A-2011/141720 provides a different method for cleaning block attachment on the support. According to this document, the cleaning block is attached to the support by pinning. To this purpose, the support comprises at least one finger projecting from a plate. During flush cycles, water dissolves the cleaning block firstly around the fingers. Thus may lead to cleaning block detachment from the support after a few flushes.

[0007] There is thus a need for a cageless toilet bowl cleaning device or a cageless support for a toilet bowl cleaning block which has not the aforementioned disadvantages.

[0008] For this purpose, the invention provides a cageless support for a toilet bowl cleaning block, the cageless support comprising:

- a body adapted to be suspended in a toilet bowl and comprising a plate, and
- a tab projecting from the plate, the tab being adapted to project into a toilet bowl cleaning block for holding said toilet bowl cleaning block in the water flush path when said body of the cageless support is suspended in the toilet bowl, so that the plate extends between the toilet bowl cleaning block and the toilet bowl wall.

[0009] According to embodiments of the invention, the

cageless support may comprise one or several of the following features:

- the tab forms a crown, the crown preferably comprising at least one opening;
- the tab forms teeth;
- the plate is adapted to protect a face of the toilet bowl cleaning block facing said plate from a direct flush flow;
- the body comprises a hook adapted to be hung at a rim of the toilet bowl;
- the cageless support comprise distance means for maintaining the plate away from the toilet bowl surface;
- the distance means are formed by a part of the body extending approximately orthogonally to a main arm of the body, said main arm of the body extending between the hook and said part of the body;
- the main arm is reinforced;
- the cageless support further comprises a linking part between the part of the body forming the distance means and the plate;
- the cageless support comprises a water collector to direct a flush flow onto the toilet bowl cleaning block when the body of the cageless support is suspended in the toilet bowl; and
- the cageless support consists in one single molded piece.

[0010] According to other aspects, the invention further relates to a toilet bowl cleaning device comprising :

- a cageless support as described here above in any combination, and
- a cleaning block covering the tab.

[0011] The invention further refers to a set for forming a toilet bowl cleaning device comprising :

- a cageless support as described here above in any combination, and
- at least one cleaning block adapted to be skewered on the crown.

[0012] The invention also pertains to a method for producing a toilet bowl cleaning device as described here above, comprising the steps of:

- a) providing a cageless support as described here above in any combination, and
- b) molding the cleaning block over the tab.

[0013] According to an embodiment, step a) comprises:

- i) molding the cageless support in one single piece.

[0014] Other features and advantages of the invention

will appear from the following description given as an example and with reference to the drawings which show:

- figures 1 and 2, different views of a first embodiment of a cageless support for a toilet bowl cleaning block ; and
- figures 3 and 4, different views of a second embodiment of a cageless support for a toilet bowl cleaning block.

[0015] As shown on figures 1 and 2, a cageless support 10 for a toilet bowl cleaning block (or solid block) comprises a body 12. The cageless support 10 consists, according to this example, in one single molded piece. The body 12 is adapted to be suspended in a toilet bowl. For this purpose, the body 12 comprises a hook 14 adapted to be hung to the toilet bowl rim.

[0016] The hook is integral with a main arm 16 of the body 12. The main arm 16 extends essentially rectilinearly from the hook 14 to a part 18 of the body 12. Of course other shapes of the main arm 16 may be considered.

[0017] The main arm 16 is consolidated or reinforced, the main arm 16 forming a bead 20 extending substantially along the whole length of the main arm 16.

[0018] At the end of the main arm 16, opposite to the hook 14, the main arm 16 is integral with a part 18 of the body 12 forming distance means whose function is to keep the block away from the toilet bowl wall. The part 18 of the body extends approximately orthogonally to the main arm 16.

[0019] The part 18 of the body 12 has a free end 22, opposite to the end linked with the main arm 16. This free end 22 is adapted to abut against the toilet bowl wall to keep the toilet bowl cleaning block away from this wall.

[0020] In the neighborhood of this free end 22, the part 18 of the body 12 is integral with a linking stem 24 which links the part 18 of the body 12 forming distance means to a plate 26.

[0021] A tab 28 projects from the plate 26. In present case, the tab forms a crown 28. The crown is adapted to project into a toilet bowl cleaning block for holding the toilet bowl cleaning block in the water flush path when the body 12 of the cageless support 10 is suspended in the toilet bowl. The crown can project into the toilet bowl cleaning block either because the toilet bowl cleaning block is skewered onto the crown 28 or because it is molded over said crown 28. Using a tab or a crown 28 increases the contact surface with the toilet bowl cleaning block, relatively to fingers as depicted in WO-A-2011/141720. Thus the risk of a detachment of the toilet bowl cleaning block is reduced. Moreover, to reduce this risk, the tab or crown 28 may comprise teeth 30 which help to skewer the toilet bowl cleaning block onto the crown. Finally, still to reduce the risk that the toilet bowl cleaning block falls, the crown may have openings 32 therethrough (in case the toilet bowl cleaning block is molded over the tab or crown). These openings also help

the flushing water to enter in contact with the part of the toilet bowl cleaning block which is comprised within the crown 28.

[0022] In the present case, the dimensions of the crown may be in the following ranges:

- height/depth H of the crown (i.e. dimension from the plate 26 to the top free end of the crown, in a direction perpendicular to the plate): from 9 to 12 mm;
- length L of the crown (i.e. largest dimension in a plane parallel to the plate 26 or dimension of the longer diagonal of the lozenge): from 31 to 35 mm;
- width W of the crown (i.e. smallest dimension in a plane parallel to the plate 26 or dimension of the smaller diagonal of the lozenge): from 16 to 20 mm.

[0023] The tab 28 may have different forms like a lozenge shaped or round shaped crown. It may even have an open shape as long as it forms at least one angle (in a plane parallel to the plate). Indeed, this or these angles increase the holding power of the tab. However, a closed shape of the crown is preferred since it allows a better holding of the toilet bowl cleaning device on the plate. Moreover, a closed shaped crown is more robust so that a toilet bowl cleaning block can be pressed onto the crown. Fingers projecting from the plate are more fragile, so that the toilet bowl cleaning block has to be melted on the hook and then it is necessary to let it pour. Moreover, a crown design ensures that the middle part of the toilet bowl cleaning block always dissolves at the end of the product lifespan, whereas a toilet bowl cleaning block fixed using fingers dissolves rather randomly, so that is not possible to ensure that the toilet bowl cleaning block stay fixed to the hook until it is totally consumed.

[0024] On the contrary, when the toilet bowl cleaning block is in place on the crown, the plate 26 protects the surface of the block facing this plate 26 from a direct flush flow. Thus the block is consumed from one face, allowing a constant rely on treatment composition during complete lifespan of the toilet bowl cleaning block. This also reduces the risk that the block falls from the crown, since the face of the toilet bowl cleaning block through which the tab or crown projects from the plate into the toilet bowl cleaning block does not enter in contact with flush water.

Moreover, the plate 26 avoids that the block touches the toilet bowl wall. This is also ensured since the distance means maintains the plate away from the toilet bowl wall.

[0025] Figures 3 and 4 show a second embodiment of a cageless support 100 for a toilet bowl cleaning block. On these figures, the elements identical to the elements of figures 1 and 2 or having the same function are indicated by the same numeral references. These elements are not described again.

[0026] The cageless support 100 for a toilet bowl cleaning block according to this second embodiment differs from the first one shown on figures 1 and 2 since it further comprises a water collector 34 to direct a flush flow onto the toilet bowl cleaning block when the body 12 of the

cageless support 100 is suspended in the toilet bowl. The water collector 34 improves water flow on front side of the solid block (the one which does not face the plate 26) especially in toilets with weak flushing system. The water collector 34 may be formed by a water deflector or by any other water driving means.

[0027] The cageless supports 10, 100 according to the two embodiments may be used in a toilet bowl cleaning device. This toilet bowl cleaning device then comprises:

- a cageless support 10, 100 according to one of the two embodiments described here above, and
- a toilet bowl cleaning block covering the crown.

[0028] The toilet bowl cleaning block may have any shape and be made of any suitable material known by the man skilled in the art.

[0029] The toilet bowl cleaning device can be produced according to a method, comprising the steps of:

- a) Providing a cageless support 10, 100 according to one of the two embodiments described here above, for example by molding it as one single piece and
- b) Molding the cleaning block over the crown 28.

[0030] The cageless supports 10, 100 according to the two embodiments may also be used in a set for forming a toilet bowl cleaning device, which then comprises:

- a cageless support 10, 100 according to one of the two embodiments described here above, and
- at least one toilet bowl cleaning block adapted to be skewered on the crown.

[0031] The invention has been described with reference to preferred embodiments. However, many variations are possible within the scope of the invention, defined by the appended claims.

Claims

1. A cageless support (10) for a toilet bowl cleaning block, the cageless support (10) comprising:

- a body (12) adapted to be suspended in a toilet bowl and comprising a plate (26), and
- a tab (28) projecting from the plate (26), the tab (28) being adapted to project into a toilet bowl cleaning block for holding said toilet bowl cleaning block in the water flush path when said body (12) of the cageless support (10) is suspended in the toilet bowl, so that the plate extends between the toilet bowl cleaning block and the toilet bowl wall.

2. The cageless support of claim 1, wherein the tab (28)

forms a crown, the crown preferably comprising at least one opening (32).

3. The cageless support of claim 1 or 2, wherein the tab (28) forms teeth (30).

4. The cageless support of one of claims 1 to 3, wherein the plate (26) is adapted to protect a face of the toilet bowl cleaning block facing said plate (26) from a direct flush flow.

5. The cageless support of any one of claims 1 to 4, wherein the body (12) comprises a hook (14) adapted to be hung at a rim of the toilet bowl.

6. The cageless support of any one of claims 1 to 5, comprising distance means (18) for maintaining the plate (26) away from the toilet bowl surface.

7. The cageless support of claim 6, wherein the distance means are formed by a part (18) of the body (12) extending approximately orthogonally to a main arm (16) of the body (12), said main arm (16) of the body (12) extending between the hook (14) and said part (18) of the body (12).

8. The cageless support of claim 7, wherein the main arm (16) is reinforced.

9. The cageless support of claim 7 or 8, further comprising a linking part (24) between the part (18) of the body (12) forming the distance means and the plate (26).

10. The cageless support of any one of claims 1 to 9, comprising a water collector (34) to direct a flush flow onto the toilet bowl cleaning block when the body (12) of the cageless support (100) is suspended in the toilet bowl.

11. The cageless support of any one of claims 1 to 10, consisting in one single molded piece.

12. A toilet bowl cleaning device comprising :

- A cageless support (10, 100) according to anyone of claims 1 to 11, and
- A cleaning block covering the tab.

13. A set for forming a toilet bowl cleaning device comprising :

- A cageless support (10, 100) according to anyone of claims 1 to 11, and
- At least one cleaning block adapted to be skewered on the crown.

14. A method for producing a toilet bowl cleaning device

according to claim 12, comprising the steps of:

- a) Providing a cageless support (10, 100) according to anyone of claims 1 to 11, and
- b) Molding the cleaning block over the tab (28). 5

15. The method of claim 14, wherein step a) comprises:

- i) Molding the cageless support (10, 100) in one single piece. 10

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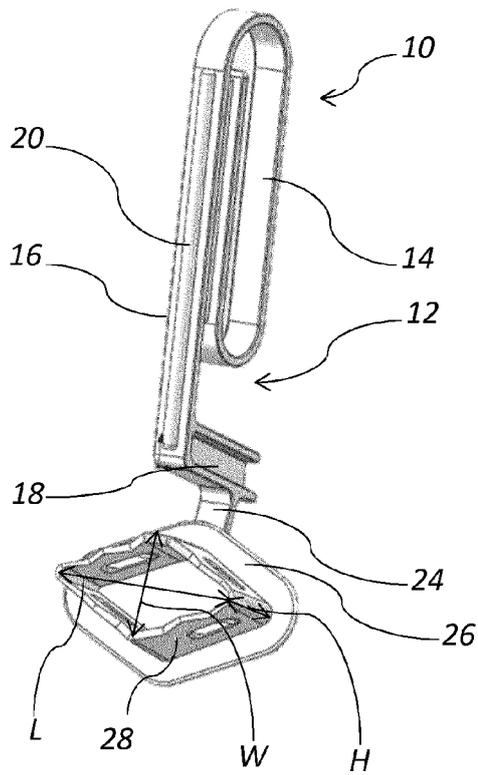


Figure 1

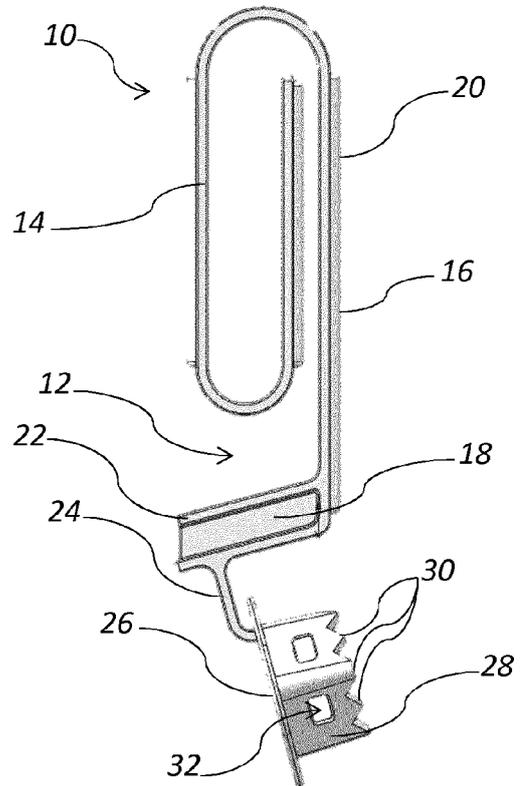


Figure 2

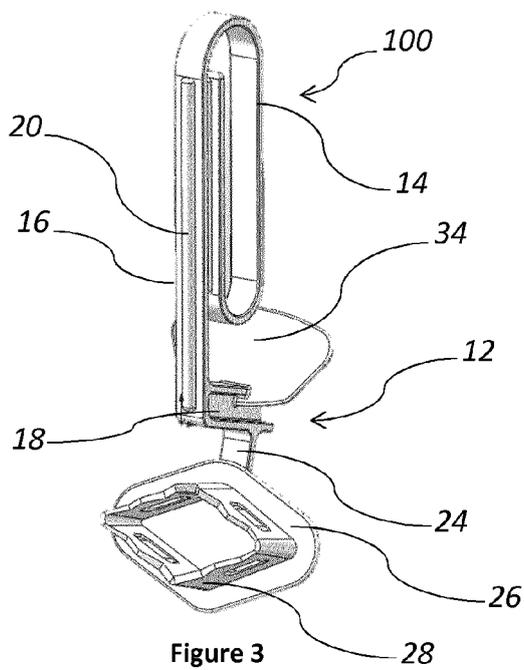


Figure 3

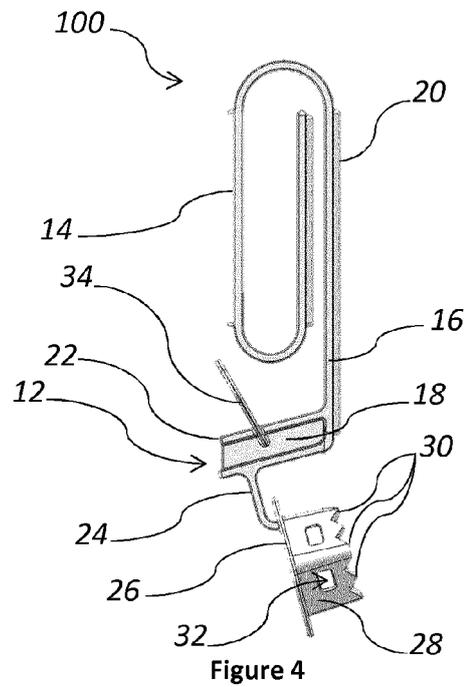


Figure 4



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Application Number
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Place of search The Hague		Date of completion of the search 20 June 2013	Examiner Urbahn, Stephanie
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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