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(54) Attachment device suitable for the reversible connection between a toilet lid and seat and corresponding toiled lid

(57) Attachment device suitable for the reversible connection between a toilet lid and seat and corresponding toilet lid. The device comprises connection means (4) to said lid (2), reversible attachment means (5) for seat (3) and actuating means (6) for said attachment means (5). Thus the device (1) has a release position, in which said attachment means (5) are separated from said seat (3) as a result of activating said actuating means (6), and an attachment position, in which said attachment means (5) attach said seat (3) automatically, at least when said attachment means (5) come into contact with said seat (3) owing to the relative approach between said lid (2) and said seat (3). The invention also provides a toilet lid including the attachment device (1).

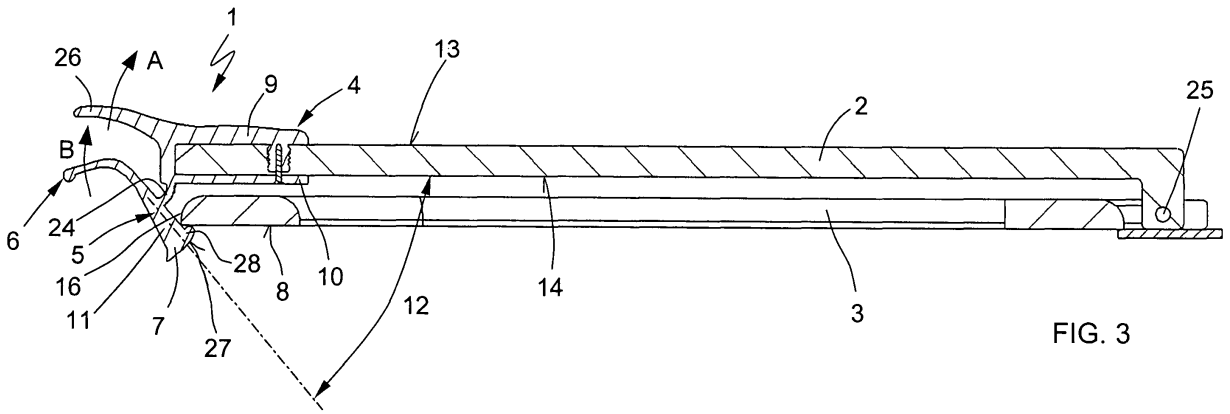

FIG. 3

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Description

Field of the invention

[0001] The invention relates to an attachment device suitable for the reversible connection between a toilet lid and seat and to a corresponding toilet lid.

State of the art

[0002] The most common WCs in the state of the art are made up of a bowl, on which there is provided a seat and a top lid which cover the main WC hole.

[0003] The lid has aesthetic, hygienic and safety functions. On the one hand, it provides an aesthetic cover for the hole in the seat and thus prevents any objects possibly falling into the WC. On the other hand, the lid minimises the dispersion of odours from the WC.

[0004] The seat has both an ergonomic and hygienic function. The seat that rests on the edge of the bowl has an inner, oval-shaped hole that is smaller than the hole of the WC bowl. By virtue of this arrangement, the surface on which the user rests is increased and therefore the user can sit down in a more ergonomic manner. On the other hand, the inward projection of the seat fulfils a hygienic function, because it reduces the size of the WC bowl hole and therefore reduces the slight splashes that are produced when a user goes to the toilet sitting down.

[0005] Furthermore, when a user goes to the toilet standing up, which is very common among male users, considerably more splashes are concerned than when the user goes to the toilet sitting down. Therefore, when the urine falls from a greater height it has more potential energy and therefore splashes with greater force against the inner walls of the WC bowl. This causes the splashes to project outwards at a greater height and the bowl and/or seat are dirtied even more. Moreover, it sometimes happens that the user does not direct the stream of urine correctly, and therefore dirties the top surface of the seat. This means that the toilet cannot be used again in optimum hygienic conditions.

[0006] Another important problem lies in the fact that even if the user is very careful when going to the toilet sitting down, the inner face of the seat is also splashed with urine and/or faeces. Therefore, it would be desirable that, in order to use the toilet; the user never has to manually handle the inner face of the seat.

[0007] No solutions are known in the state of the art for resolving the drawbacks mentioned above.

Disclosure of the invention

[0008] The purpose of the invention is to provide a device that prevents the seat from being splashed when a user goes to the toilet sitting down, and which can be incorporated into current WC models available in the market. Also the invention proposes solving the technical problem of avoiding the users having to handle the WC seat directly using their hand. Finally, the invention also considers the problem of proposing a toilet lid that simultaneously overcomes all the drawbacks described in the state of the art. This purpose is achieved by means of an attachment device of the type indicated at the beginning, characterised in that it comprises

[a] lid connection means,
[b] reversible attachment means for the seat which cooperate with the connection means, and
[c] actuating means for the attachment means, such that, the attachment device has
[d] a release position, in which the attachment means are separated from the seat as a result of at least activating the actuating means, and
[e] an attachment position, in which the attachment means attach the seat automatically, at least when the attachment means come into contact with the seat owing to the relative approach between the lid and seat.

[0009] In fact, thanks to the device according to the invention a technical effect is achieved whereby, by default, whenever the lid is raised, without activating the actuating means, the seat is also raised automatically. In the event that the user does not wish to raise the seat with the lid, said user must conscientiously activate the actuating means so as to release the attachment means and be able to leave the seat resting on the WC bowl. In this way, in this invention, under the concept of a reversible connection, it must be understood that the connection between the lid and seat can be separated when desired by the user.

[0010] With the invention it is also possible that each time the lid is lowered, said lid being separate from the seat, the device returns automatically to the attachment position. This arrangement guarantees that when next used, the device will behave correctly, in other words, in order to separate the connection between the lid and seat, the user will have to conscientiously activate the actuating means. The invention also contemplates that when the lid is raised on its own, if the user then raises the seat, the attachment device will move into the attachment position as soon as the attachment means come into contact with the seat.

[0011] On the other hand, thanks to the actuating means, the user does not need to handle the inner surface of the seat with their hands, and this guarantees that the toilet is used hygienically.

[0012] As mentioned, the invention raises the problem that, by default, the lid and seat are always connected. This implies that any reversible attachment system between the lid and seat can be applied to perform this function. For example, it would be feasible to use a magnetic attachment system. In this case, both the lid and seat would be provided with magnets with attracting opposite poles. This way, the actuating means could consist of a device that changed the polarity of one of the two

magnets, whereby the lid and seat magnets would repel against each other and the connection between the lid and seat could be separated. In another preferable embodiment, the attachment means include at least one clip, said clip forming a positive fit between a first lower support surface of the clip on the seat. In this case, the clip has a lower chamfer which, when the lid touches the seat, allows the clip to open so that it can cooperate automatically with the seat's first inner support surface.

[0013] As mentioned above, current toilet lids do not solve the problem according to the invention, and therefore it is desirable to provide a specific device that can be adapted to the toilet lids that are currently available in the market. Therefore, in a preferred embodiment, the attachment means include a top arm having a contact surface facing the top surface of the lid and an intermediate arm having a contact surface facing the second inner surface of the lid, and the attachment means include a lower arm extending from the connection means towards said seat, forming an acute angle with respect to said intermediate arm, and in that at the furthest end of the connection means, the clip projects towards the first lower support surface. By virtue of this solution, the user can adapt the device to their toilet lid without too much expense. Therefore, between the top and intermediate arms a clamp is formed which is the one that will be connected to the lid. Although this clamp is sufficient to connect the device to a current toilet lid, if deemed necessary, the device can be connected to the lid using conventional attachment means. For example, it could be envisaged to apply an adhesive between the surfaces where the device comes into contact with the lid. Other alternatives would be, for example, to use bolts or to screw the top and intermediate arms of the device to the toilet lid.

[0014] Preferably, the connection means comprise an elastic joint, and the lower arm and said actuating means extend, forming an integral part, in opposite directions from said elastic joint. In this embodiment, it is possible to economise the parts of the device, which results in considerable savings.

[0015] Another economical saving is achieved vis-à-vis the method of assembling the device parts, when the device consists of one integral part. Therefore, the device can be an injection moulded plastic part. In this embodiment, subassembly costs are avoided, and this is particularly advantageous. For example, it is not necessary to assemble any type of spring to perform the automatic clip function between the device and the WC seat, since in this case, it is the actual device that performs the elastic joint between the connection means and the attachment means, by availing of the elastic properties of the material. The materials that are suitable for this embodiment are, for example, thermoplastics such as polyamide, acrylonitrile butadiene styrene (commonly known as ABS), polyethylene, or the like. These thermoplastics can be provided, if necessary, with a certain filling agent, such as for example, fibreglass, colouring agents or others.

[0016] As mentioned, the invention also envisages a toilet lid incorporating an attachment device. Optionally, this lid forms an integral part with the attachment device. In this embodiment, it is not necessary to assemble any part on the lid, and this represents a saving on all assembly costs. The lid can be injection moulded using the plastic materials indicated above.

[0017] However, it may be interesting for the device and lid to be independent parts. For example, in the case of lids manufactured in non-plastic materials, it is not possible to provide the device and lid as one integral part. Therefore, preferably the connection means comprise a guiding housing and a main axis and the attachment means comprise a guided section inserted into the guiding housing. In this context it is understood that the connection means can be part of the actual lid or a separate part. Therefore, for example, in a particularly simple embodiment, the lid can be provided with a housing into which the guided section of the attachment means can subsequently be introduced.

[0018] When the actual lid is an integral part of the device, the attachment means can be activated in a rotary manner. Therefore, preferably, the attachment means are suitable for rotating in the guiding housing, via the guided section, around the main axis and with respect to the lid. Also, preferably, the actuating means include a rotary handle. Said rotary handle allows the lid to be grasped in a particularly comfortable and intuitive manner by the user who is not used to use a lid of this type. Moreover, it is guaranteed that the user never has to handle the inner part of the seat, which as mentioned before, could be in non-optimum hygienic conditions.

[0019] In another alternative embodiment, the attachment means are suitable for moving in the guiding housing via the guided section, along the main axis and with respect to the lid. Moreover, preferably the actuating means include a push-button or a rotary handle.

Brief description of the drawings

[0020] Other advantages and characteristics of the invention are appreciated from the following description, wherein, without any limiting character, some preferable embodiments of the invention are described, with reference to the accompanying drawings, in which:

Fig.1, a perspective view of a first embodiment of the attachment device mounted on a toilet lid and seat assembly according to the invention.

Fig. 2, a perspective view of the attachment device in Figure 1.

Fig. 3, a longitudinal section view along the central plane of the lid and seat assembly in Figure 1.

Fig. 4, a longitudinal section along the central plane of a first embodiment of a toilet lid incorporating the attachment device according to the invention, in the seat attachment position.

Fig. 5, a longitudinal section view along the central plane of a second embodiment of a toilet lid incor-

porating the attachment device according to the invention, in the seat attachment position.

Fig. 6, a longitudinal section view along a plane parallel to the central plane of the toilet lid in Figure 5, in the seat release position.

Fig. 7, a perspective view of the toilet lid in Figure 5, in the seat release position.

Fig. 8, a perspective view of a third embodiment of a toilet lid incorporating the attachment device according to the invention.

Fig. 9, a longitudinal section view along the central plane of the toilet lid in Figure 8, in the seat attachment position.

Fig. 10, a lower perspective view of a detail of the third embodiment of the lid in Figure 8, in the seat attachment position.

Fig. 11, a lower perspective view of a detail of the second embodiment of the lid in Figure 8, in the seat release position.

Fig. 12, a lower perspective view of a detail of the second embodiment of the lid in Figure 8, in the seat release position.

Detailed description of some embodiments of the invention

[0021] As it can be seen in the figures, attachment device 1 includes connection means 4 to the lid 2, reversible attachment means 5 with seat 3 and actuating means 6 that actuate the attachment means 5. In the interest of simplicity, the WC is not shown in the drawings.

[0022] The embodiment observed in Figures 1 through 3 includes a clip 7, which, in the attachment position, forms a positive fit with a first lower support surface 8. In this case, the first lower support surface 8 is the actual lower surface of seat 3. However, it is also possible that the lower surface of seat 3 has a slight step or recess forming said first lower support surface 8 on which the clip 7 is supported.

[0023] Moreover, attachment device 1 in Figures 1 through 3 can be assembled on standard toilet lids available in the market. To this end, connection means 4 of attachment device 1 include a top arm 9 having a contact surface facing the top surface 13 of lid 2 and an intermediate arm 10 having a contact surface facing the second lower surface 14 of lid 2. Therefore connection means 4 have a U-shaped clamp configuration. Said connection means 4 also have an elastic joint 24 on one of the corners of the U-shape. Actuating means 6 and attachment means 5 with a lower arm 11 extend from said elastic joint 24, in opposite directions and forming an acute angle 12 with respect to the second lower surface 14 of lid 2. In the embodiment illustrated in these three figures, attachment device 1 consists of one integral part, whereby the manufacture thereof is particularly economical.

[0024] Attachment device 1 illustrated in Figures 1 through 3 operates in the following way. By default, attachment device 1 is active, in other words, when lid 2 is held by handle 26 and raised, rotating it around WC hinge 25 in the direction of the arrow A in Figure 3, clip 7 simultaneously drags seat 3. In this invention, this operating mode of device 1 is called the attachment position.

[0025] When the user does not want seat 3 to be raised when handle 26 is pulled, it is necessary to conscientiously activate actuating means 6 so as to move into the release position of device 1. In this position, the user rests his thumb finger on the surface of handle 26 and using his index finger pulls on actuating means 6 in the direction of arrow B in Figure 3. When actuating means 6 are pulled, an opening torque is produced in attachment means 5 around elastic joint 24, which makes the end projection 28 of clip 7 separate from the first lower support surface 8. The user must perform a sufficient pulling action on actuating means 6 for end projection 28 to be able to pass front edge 16 of seat 3 without touching it. This position is called the release position. Without yet releasing the actuating means 6, the user lifts lid 2 rotating it around hinge 25 in the direction of arrow A in Figure 3. With this movement, lid 2 is raised and seat 3 remains resting upon the toilet bowl.

[0026] Finally, when the user has finished using the toilet, he/she proceeds once again to lower lid 2. To do this, it is enough to gently support lid 2 and let it drop onto seat 3. When the front surface of clip 27 touches the surface of seat 3, attachment means 5 tilt around elastic joint 24 in the direction of arrow B and they open. After passing first lower support surface 8 of seat 3, elastic joint 24 returns attachment means 5 to their rest position and therefore clip 7 clicks again to adopt the attachment position of attachment device 1.

[0027] Figure 4 illustrates an embodiment in which attachment device 1 forms an integral part with lid 2. Said lid 2 can be manufactured in plastic, for example, through injection moulding. This embodiment eliminates all subsequent assembly costs of device 1 to lid 2 and therefore represents a considerable economic saving. In this case, connection means 4 to lid 2 consist of a bridge 20 which also incorporates the function of elastic joint 24 described in relation to the embodiment shown in Figures 1 through 3. With respect to the operating principle, this embodiment of lid 2 operates according to the same principle described in the preceding paragraphs.

[0028] In Figures 5 through 7, attachment device 1 is also incorporated in lid 2. In lid 2 in this embodiment, connection means 4 and lid 2 form an integral part. This way connection means 4 comprise a guiding housing 21 that defines a main axis 23. Attachment means 5 include a guided section 22 that is shown in Figure 5, which is inserted into guiding housing 21. Attachment means 5 can move along main axis 23 to move from the attachment position, shown in Figure 5, to the release position, shown in Figure 6. In order to pass from one position to the other, the user must press push-button 18 of the actuating means 6 in the direction of arrow C in Figure 5. In this case, the attachment action is produced by the inner perimeter of seat 3. However, the attachment action

could also be produced by the outer perimeter. Furthermore, the actuating means 6 could comprise a rotary handle 19 instead of the press push-button 18.

[0029] The operating principle of the embodiment of lid 2 shown in Figures 5 through 7 is similar to that described above. By default, when the lid 2 is raised by the rod of guided section 22, attachment device 1 drags seat 3. This way, if the user wants seat 3 to remain on the WC bowl, it is necessary to conscientiously activate push-button 18 in order to move from the attachment position in Figure 5, to the release position in Figure 6. Lid 2 in this case includes an end of stroke stopper 17 which notifies the user that end projection 28 of clip 7 has passed the inner diameter of seat 3, whereby it is possible to raise just lid 2, as shown in Figure 7. In this case, in between connection means 4 and attachment means 5 a spring 15 is provided, which guarantees the return of attachment means 5 to their attachment position.

[0030] In the lid shown in Figures 8 through 12, attachment device 1 is activated by rotating actuating means 6. In this case, guided housing 21 of lid 2 is in the vertical position, such that main axis 23 is also in the vertical direction. Connection means 4 to lid 2 consist, in this case, of screws. Guided section 22 of attachment means 5 is also inserted into guided housing 21. In this case, attachment means 5 rotate around main axis 23 when they are actuated by rotary handle 19 that forms part of actuating means 6. Figure 10 shows attachment device 1 in its attachment position. In this position, clip 7 is supported on the first lower surface 8 of seat 3. Figure 11 shows attachment device 1 in its release position, after rotary handle 19 has been turned around main axis 23 in the direction of arrow D in Figure 10. Similar to the case of lid 2 having attachment device 1 in linear movement, this embodiment includes two end of stroke stoppers 17 which delimit the trajectory of rotary handle 19 between the device attachment and release positions. Also as in the preceding case, a spring 15 is responsible for returning attachment means 5 from their release position to their attachment position.

[0031] Attachment device 1 is also, by default, in the attachment position in Figure 10. In this position when the user pulls rotary handle 19 causing the lid 2 to rotate around hinge 25, lid 2 and seat 3 are raised together. This way, if the user wants seat 3 to remain resting on the WC, said user must conscientiously rotate rotary handle 19 in the direction of arrow D in Figure 10, until the release position is reached, which is shown in Figure 11. This way, the user will only raise lid 2, as shown in Figure 8.

[0032] When the user drops lid 2 on seat 3 which is resting on the WC, the first part that comes into contact with lid 2 is end projection 28. The chamfer of end projection 28 produces an opening torque for attachment means 5 in the direction of arrow D in Figure 10, which allows clip 7 to open an then to click automatically thanks to the spring 15. This arrangement guarantees that attachment device 1 works correctly and that the conditions of use are as hygienic as possible.

Claims

1. Attachment device suitable for the reversible connection between lid (2) and seat (3) of a toilet, **characterised in that** it comprises

   [a] connection means (4) to said lid (2),
   [b] reversible attachment means (5) for said seat (3) which cooperate with said connection means (4), and
   [c] actuating means (6) for said attachment means (5),
   such that, said attachment device (1) has
   [d] a release position, in which said attachment means (5) are separated from said seat (3) as a result of at least activating said actuating means (6), and
   [e] an attachment position, in which said attachment means (5) attach said seat (3) automatically, at least when said attachment means (5) come into contact with said seat (3) owing to the relative approach between said lid (2) and said seat (3).

2. Attachment device according to claim 1, **characterised in that** said attachment means (5) comprise at least one clip (7), said clip (7) forming a positive fit with a first lower support surface (8) of said clip (7) on said seat (3).

3. Attachment device according to claim 1 or 2, **characterised in that** said connection means (4) comprise a top arm (9) having a contact surface facing the top surface (13) of said lid (2) and an intermediate arm (10) having a contact surface facing the second lower surface (14) of said lid (2), and said attachment means (5) comprise a lower arm (11) which projects from said connection means (4) towards said seat (3), forming an acute angle (12) with respect to said intermediate arm (10), and **in that** in the furthest end of said connection means (4), said clip (7) projects towards said first lower support surface (8).

4. Attachment device according to claim 3, **characterised in that** said connection means (4) comprise an elastic joint (24), and said lower arm (11) and said actuating means (6) extend in opposite directions, forming an integral part, from said elastic joint (24).

5. Attachment device according to any of the claims 1 through 4, **characterised in that** said device (1) consists of one integral part.

6. Toilet lid incorporating an attachment device (1) according to claim 1 or 2.

7. Toilet lid according to claim 6, **characterised in that** it forms an integral part with said attachment device (1).

8. Toilet lid according to claim 6, **characterised in that** said connection means (4) comprise a guided housing (21) and a main axis (23) and **in that** said attachment means (5) include a guided section (22) inserted into said guided housing (21).

9. Toilet lid according to claim 8, **characterised in that** said attachment means (5) can rotate on their own axis in said guided housing (21) via said guided section (22), around said main axis (23) and with respect to said lid (2).

10. Toilet lid according to claim 8 or 9, **characterised in that** said actuating means (6) comprise a rotary handle (19).

11. Toilet lid according to claim 8, **characterised in that** said attachment means (5) are suitable for moving in said guided housing (21) via said guided section (22), along said main axis (23) and with respect to said lid (2).

12. Toilet lid according to claim 8 or 11, **characterised in that** said actuating means (6) comprise a push-button (18).

13. Toilet lid according to claim 8 or 11, **characterised in that** said actuating means (6) comprise a rotary handle (19).

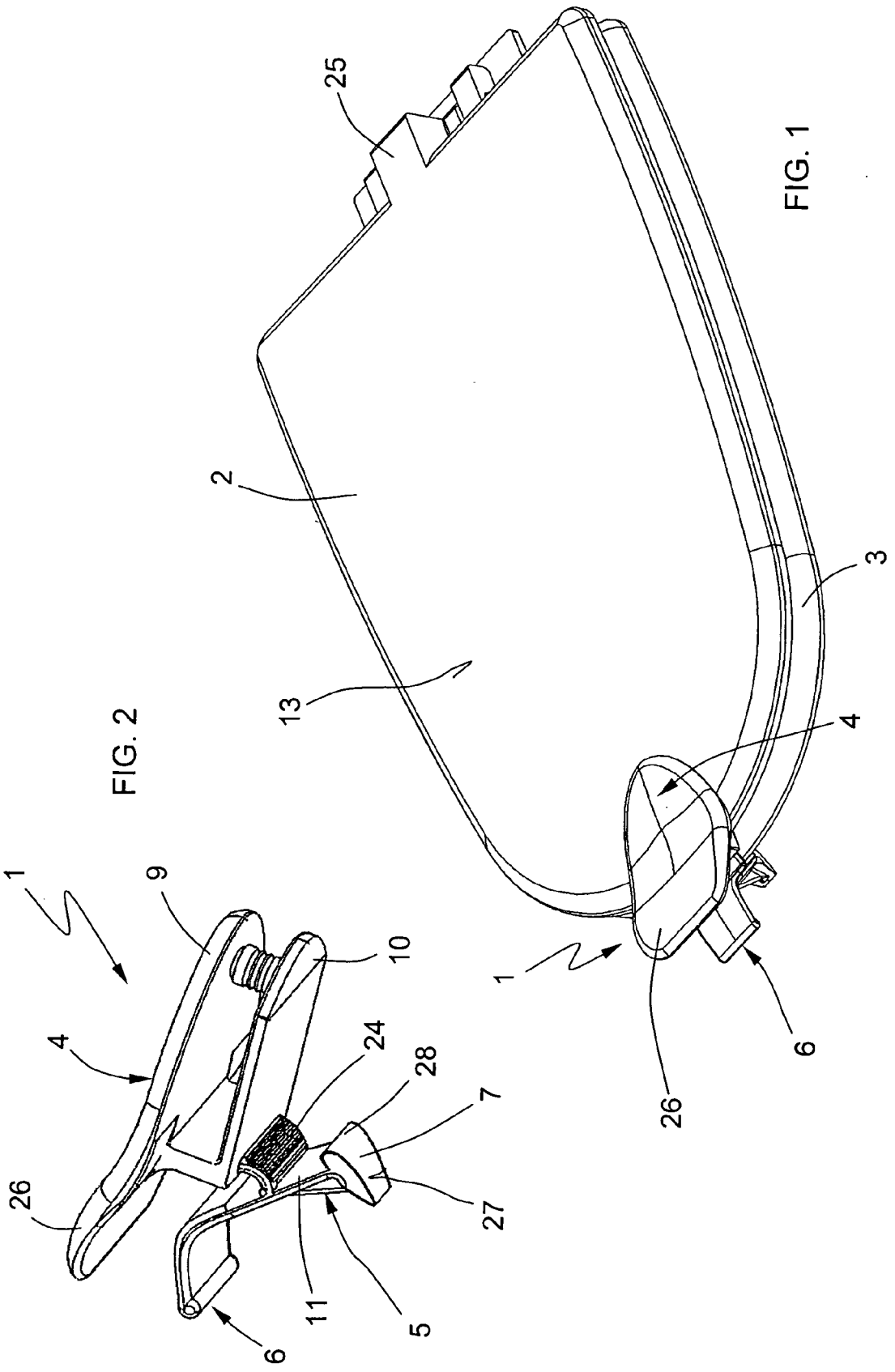

FIG. 1

FIG. 2

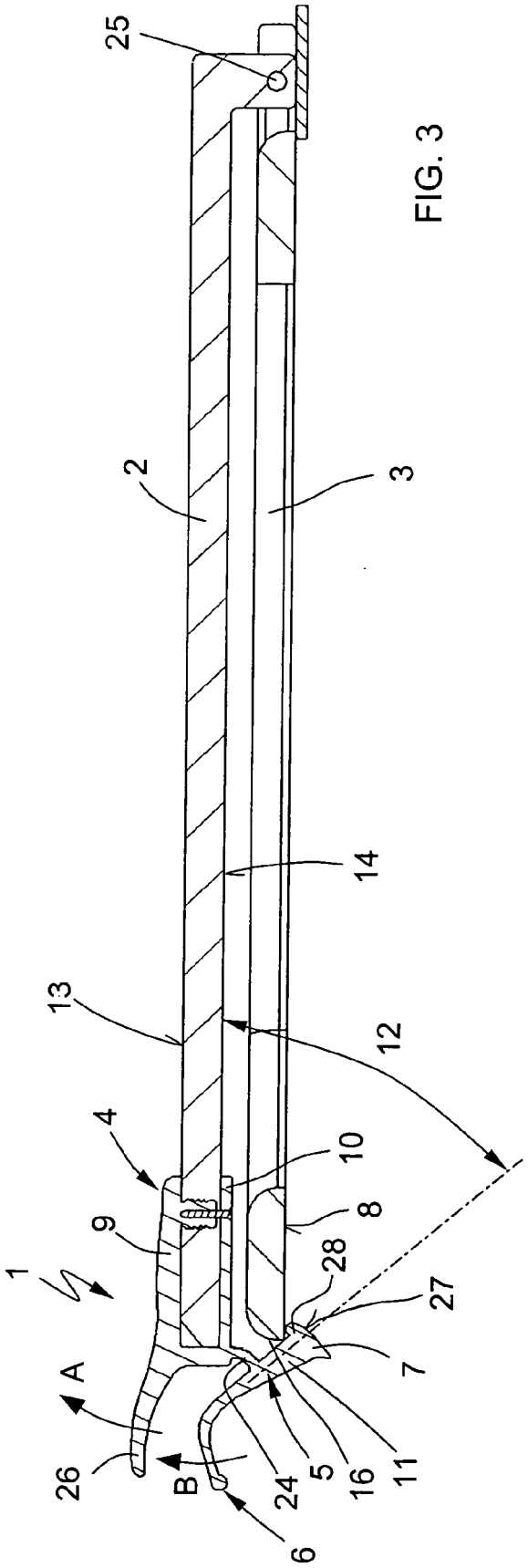
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FIG. 3

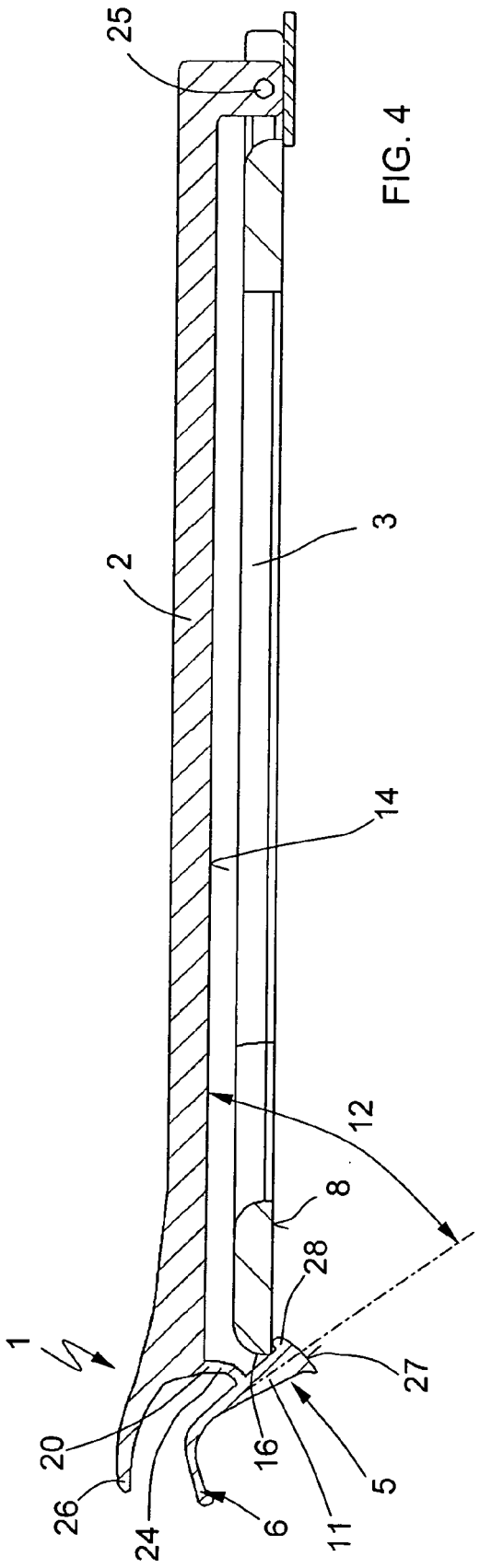
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FIG. 4

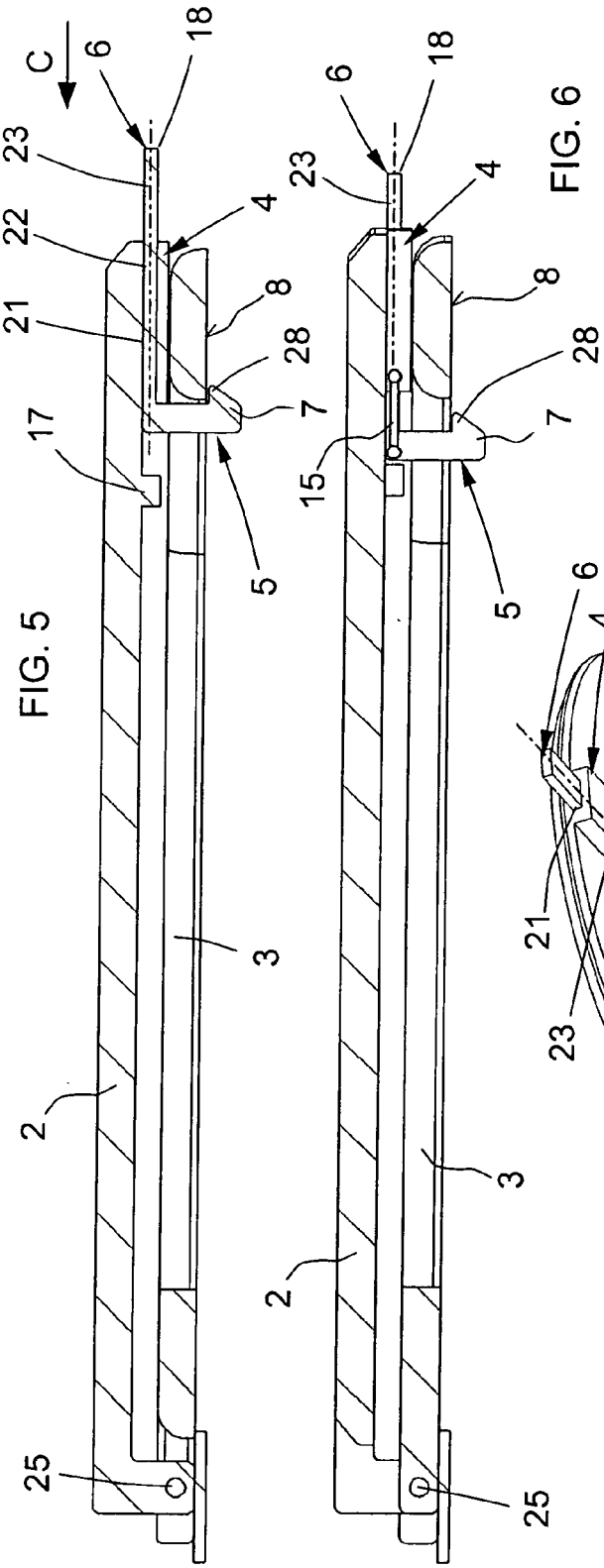

FIG. 5

FIG. 6

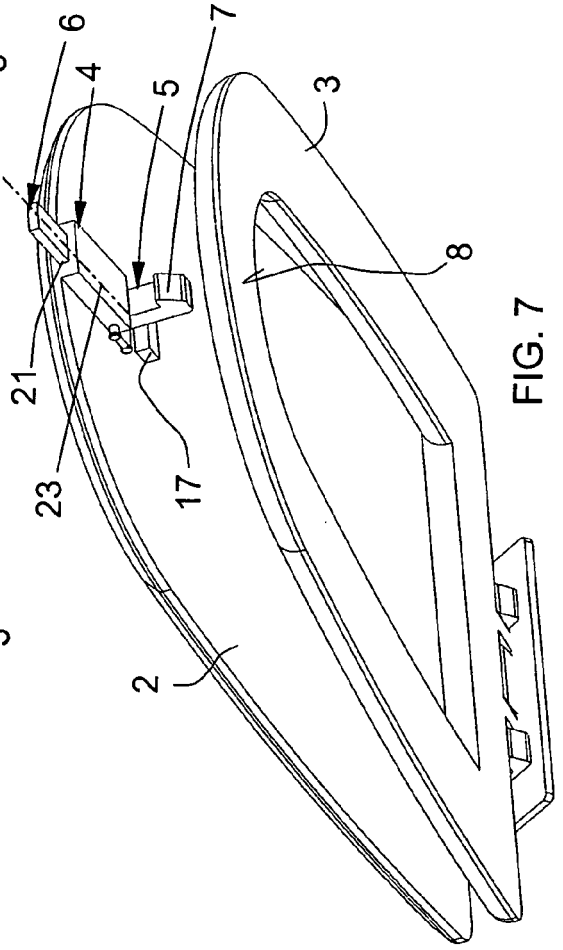

FIG. 7

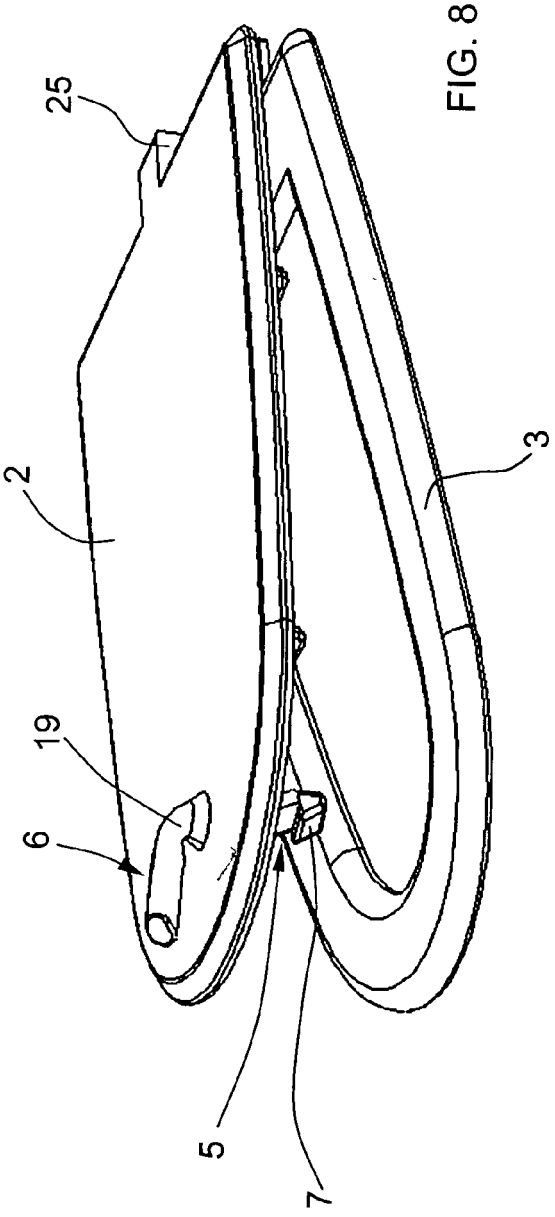

FIG. 8

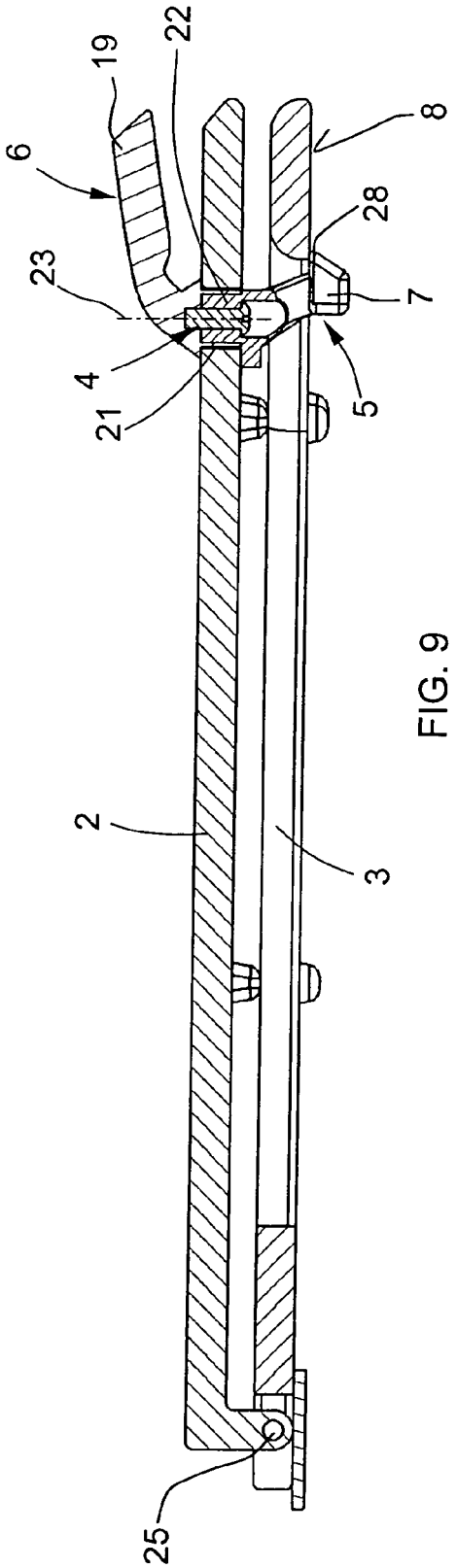

FIG. 9

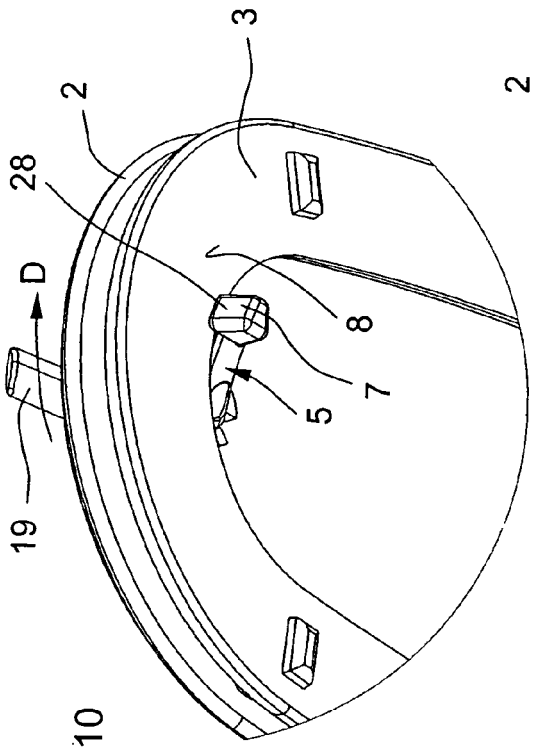

FIG. 10

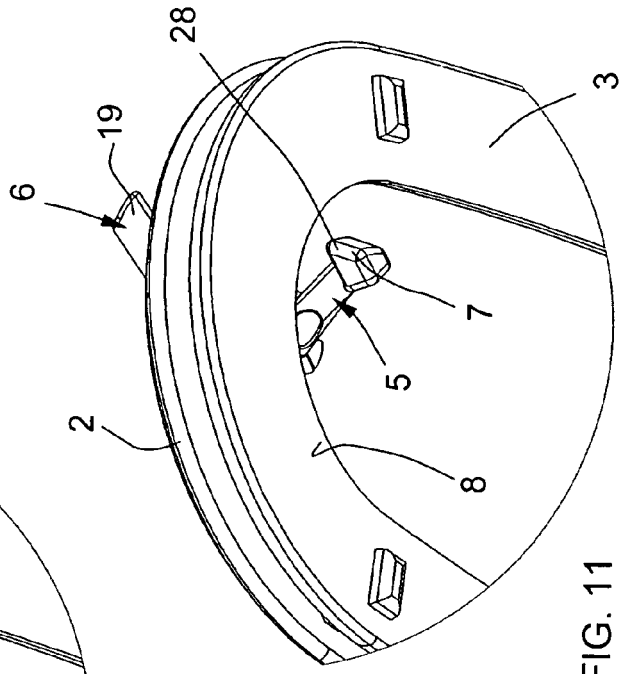

FIG. 11

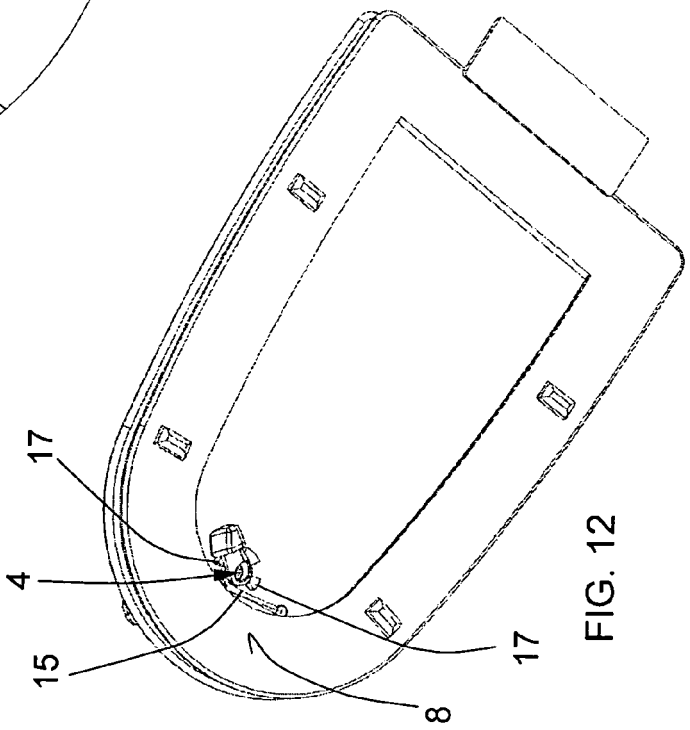

FIG. 12

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 38 0282

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2005/223480 A1 (MILLER STEPHEN H [US] ET AL) 13 October 2005 (2005-10-13) * page 2, paragraph 18 - page 3, paragraph 24; figures *	1,2,5,6, 8-13	INV. A47K13/10
X A	JP 2003 299596 A (SUZUKI MIYOKO) 21 October 2003 (2003-10-21) * abstract; figures 1-5 *	1,2,5,6, 8-10,13 3	
X	US 6 842 916 B1 (GUNN JUSTIN [US] ET AL) 18 January 2005 (2005-01-18) * column 3, line 6 - column 4, line 30; figures *	1,2,5,6, 8,11,12	
X	US 6 212 694 B1 (PORZIO THOMAS [US]) 10 April 2001 (2001-04-10) * column 3, line 10 - column 5, line 21; figures 1-6 *	1,2,5-7	
			TECHNICAL FIELDS SEARCHED (IPC)
			A47K

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	7 March 2007	FAJARNES JESSEN, A

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005223480 A1	13-10-2005	NONE	
JP 2003299596 A	21-10-2003	JP 3792173 B2	05-07-2006
US 6842916 B1	18-01-2005	NONE	
US 6212694 B1	10-04-2001	NONE	

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