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**(54) Toilet hinge fastening arrangement**

Befestigungsanordnung für Toilettenscharnier

Dispositif de fixation pour charnière de toilettes

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## Description

### Field of the invention

[0001] The invention relates to the field of fastening toilet seats to toilet bowls, and more particular to the fastening of hinges to toilet bowls.

### Background of the invention

[0002] WO 9111950 A1 discloses a toilet hinge fastening arrangement according the preamble of claim 1.

[0003] US 5,933,875 discloses a lift-off toilet seat hinge comprising a hinge base member adapted to be mounted on a toilet bowl, a hinge support member adapted to pivotally support a toilet seat, a locking member supported for rotation between a locked position, where the support member is secured to the base member, and an unlocked position. The base member and the locking member include corresponding arcuate projections which engage when the locking member is in the locking position. The locking member is used to clamp the hinge support member to the base member. Therefore the locking force needs to exceed the forces applied to the hinge support member. The projections of the locking member will be subject to a relatively high level of stress in the locked position in order to provide the necessary locking force. Furthermore it is required to manufacture the projections in the locking member and base member with small tolerances to achieve the necessary locking force.

### Object of the invention

[0004] It is therefore an object of the present invention to provide a toilet hinge which is easy to attach and remove from the toilet bowl, where the stresses within the locking member are low, and which is of a design with little complexity and few parts and which promote hygiene.

### Description of the invention

[0005] According to the invention the object is obtained in that the shaft member is releasably retained in a grove provided in the base member, said grove having either a first recess or a first protrusion which is respectively adapted to cooperate with a complementary first protrusion or a first recess on the shaft member to secure the shaft member to the base member, that the locking member is adapted to be inserted into the grove, said grove having either a second recess or a second protrusion which is respectively adapted to cooperate with a complementary second protrusion or second recess on the locking member and providing a locked position for the locking member where the shaft member is retained.

[0006] The shaft member is retained by the base member. It is hereby achieved that the majority of forces applied to the shaft member is taken up by the base mem-

ber. The locking member is decoupled from the primary load path, and will only be subject to the forces required to keep the shaft member in place. Thus the stresses within the locking member are low.

[0007] The shaft slides into the grove in a direction, which is substantially perpendicular to a centreline through the shaft member. The grove is having either a first recess or a first protrusion. If the grove has a first recess the shaft member will have a complementary protrusion that fits into said first recess to secure the shaft member to the base member. If the grove has a first protrusion the shaft member will have a complementary recess into which the first protrusion fits to secure the shaft member to the base member.

[0008] The first recess and first protrusion may have various shapes, such as square, triangular, rounded, tapered, undercut or a combination. The shape is chosen to best solve their purpose of securing the shaft member to the base member and transferring the loads from the shaft member to the base member.

[0009] The toilet hinge fastening arrangement is mounted to a toilet bowl and connected to a hinge arrangement, which is connected to a toilet seat. The toilet seat is connected to at least two hinges. Usually the toilet seat is symmetrical with a symmetry plane located between the two hinges. Therefore each hinge will carry half of the force that the toilet seat hinge arrangement is subject to. The forces are mainly in a direction forward and aft with respect to the toilet. The sideways forces are negligible.

[0010] The locking member is moved to the locked position in the grove by a linear or nonlinear movement. The cooperating second protrusion and second recess in the locking member and base member respectively is guiding the movement of the locking member. If the grove is having a second recess the locking member will have a second protrusion and vice versa. Preferably the locking member will cover the part of the grove not already covered by the shaft member, such that the appearance of the combined base member, shaft member and locking member will be that of one single unit. Without voids or cavities which may be difficult to clean and thereby will promote bacteria growth.

[0011] The second recess and second protrusion may have various shapes, such as square, triangular, rounded, tapered, undercut or a combination. The shape is chosen to best solve their purpose of guiding the locking member into the grove.

[0012] Preferably the grove is located such that the shaft member is inserted in a sideways direction with respect to the toilet. It is an advantage if the locking member is made to a slight oversize to provide friction between the second protrusion and second recess. The friction will provide a locking force to keep the locking member in place. As the sideways forces are negligible the locking force need only to be small.

[0013] According to a preferred embodiment, the first recess and the second recess are coinciding.

**[0014]** In this embodiment there is only one recess. The shaft member and locking member will thereby share the recess. From a manufacturing point of view it is preferred to combine the undercut and first recess into one structural feature. This will remove some complexity from the design. It is especially suitable when the sideways forces are small. The locking force is dependent on friction between the recess and the second protrusion. Therefore the recess and second protrusion may be provided with a rough surface to increase the friction.

**[0015]** According to a further preferred embodiment, the second recess is substantially parallel to a centreline through the shaft member.

**[0016]** The shaft member will be retained by the first recess and the locking member by the second recess. The direction of the two recesses will be substantially perpendicular. Therefore sideways movement of the shaft member is prevented by mechanical means as long as the locking member is inserted. The achievable resistance against sideways forces of the shaft member is substantial and only limited by the strength of the second recess and second protrusion. Therefore this solution will be able to provide even large locking forces.

**[0017]** According to a still further preferred embodiment, it comprises a cover for housing the base member and locking member, said cover having an opening for the shaft member.

**[0018]** The cover surrounds the base member and the locking member. It is hereby achieved that the locking member is maintained in the locked position by the cover. The cover may abut the toilet bowl.

**[0019]** Furthermore the cover will promote the hygiene and general appearance of the toilet hinge fastening arrangement.

**[0020]** According to yet a further preferred embodiment, it comprises a resilient underlay member to be placed between the base member and a toilet bowl.

**[0021]** When the fastener is tightened the resilient layer will even out any spaces between the base member and toilet bowl. Such spaces may be caused by manufacturing tolerances of the base member and toilet bowl. This will distribute the stresses across the surface of the base member such that stress concentrations are avoided.

**[0022]** According to yet a still further preferred embodiment, the base member and the locking member includes a corresponding third recess and third protrusion, where the third protrusion extends into the third recess when the locking member is in the locked position.

**[0023]** It is hereby achieved that the locking member itself is provided with mechanical means which will keep the locking member in the desired position inside the grove.

**[0024]** The third recess and third protrusion may have various shapes, such as square, rounded, triangular or a combination. The shape is chosen to best solve the purpose of securing the locking member inside the grove to avoid accidentally release of the locking member, while it is possible for a person to release the locking member

by applying the force of his or her fingers.

**[0025]** The third recess and protrusion may add to the locking force and may therefore be used as part of the mechanical means to secure the shaft member.

5 **[0026]** According to another preferred embodiment, the third recess is provided in the base member and the third protrusion is provided on the locking member.

**[0027]** Depending on the design of especially the base member it may be practical to locate the third recess in the base member from a manufacturing point of view to be able to de-mould the base member. It may also be the case that the design of the locking member dictates the need to place the third protrusion on the locking member. This is subject to a trade-off analysis and a combined effort during design and preparations for manufacture.

10 **[0028]** According to another further preferred embodiment, the third recess is provided in the locking member and the third protrusion is provided on the base member.

**[0029]** Depending on the design of especially the base member it may be practical to locate the third protrusion on the base member from a manufacturing point of view to be able to de-mould the base member. It may also be the case that the design of the locking member dictates the need to place the third recess in the locking member. This is subject to a trade-off analysis and a combined effort during design and preparations for manufacture.

20 **[0030]** According to another still further preferred embodiment, it comprises an anchor assembly for retaining the fastener, said anchor assembly being adapted to be inserted within an opening in the toilet bowl with a wall portion and a concealed side, said anchor assembly comprises two elongated leg members, a threaded anchor member coupled to said leg members at opposite end portions and a collar member secured to said leg members for sandwiching said wall portion between said collar and said anchor member.

30 **[0031]** The anchor assembly will provide an attachment for the toilet hinge fastening arrangement to the toilet bowl which is easy to install especially if the attachment point for the anchor assembly is on a concealed side. This is often the case with toilet bowls for aesthetic and hygienic purposes.

**[0032]** The anchor assembly may be chosen among known anchor assemblies.

40 **[0033]** The different members of the toilet hinge fastening arrangement may be made of different materials such as plastics or metals.

**[0034]** A major consideration when selecting materials is their ability to withstand the cleaning chemicals used for this particular application.

50 **[0035]** In a preferred embodiment of the invention the anchor member is made of steel with a threaded collar member of POM or ABS. The fastener for the base member is made of stainless steel, the underlay member is made of a SEBS with a softener, the base member and locking member is made of a reinforced polymer such as PA, the shaft member is made of stainless steel, the cover is made of UREA.

### Description of appended drawings

**[0036]** The invention will now be described in more detail with reference to a specific embodiment of the invention. The example may not be construed as limiting on the scope of the invention as the scope is determined by the appended claims, but the example merely serves to illustrate the invention.

- Fig. 1 shows a toilet cover assembly including a toilet seat and a toilet hinge fastening arrangement,
- Fig. 2 shows an expanded perspective view of the toilet hinge fastening arrangement,
- Fig. 3 shows a vertical sectional view through the toilet hinge fastening arrangement,
- Fig- 4a-m show different views of the elements constituting the toilet hinge fastening arrangement,
- Fig. 5 show a detail view of a second embodiment of to the invention, and
- Fig. 6 show a detail view of a third embodiment of the invention.

**[0037]** In the detailed description identical or like elements will be given the same reference number within the entire set of figures. All details may therefore not be included with the description of each figure.

### Detailed description of preferred embodiments

**[0038]** Fig. 1 illustrates a toilet cover assembly 23, comprising a toilet cover 24, a toilet seat 25, a toilet hinge arrangement 7 and two toilet hinge fastening arrangements 1. The toilet cover assembly 23 is adapted to be installed on a toilet bowl (not shown) secured by the toilet hinge fastening arrangement 1.

**[0039]** The toilet hinge fastening arrangement 1 is depicted in Fig. 2, 3 and 4a to 4m in further details together with the toilet hinge arrangement 7. The shown embodiment comprise; a base member 2, a fastener 3, a shaft member 5, a locking member 8, a cover 14, an underlay member 16 and an anchor assembly 19.

**[0040]** The lower face of the base member 2 is adapted to abut the toilet bowl. A resilient underlay member 16 is located between the base member 2 and the toilet bowl, to avoid stress concentrations in the base member 2. Both the base member 2 and underlay member 16 has a mounting hole 4, 26 for the fastener 3. Both mounting holes 4, 26 may be slotted to provide means for adjusting the position of the base member 2. The mounting hole 4 in the base member 2 is preferably adapted to accommodate the head of the fastener 3, such that is flush with the bottom surface of the groove 9 in the base member 2. The head of the fastener 3 may be counter sunk, flat or any other suitable shape.

**[0041]** The fastener 3 connects to a threaded anchor member 21 of the anchor assembly 19, such that it se-

cures the base member 2 to the toilet bowl when the fastener 3 is tightened.

**[0042]** Further to the anchor member 21 the anchor assembly 19 comprise two elongated leg members 20 and a collar member 22. The collar member 22 has an opening for the fastener 3. The anchor assembly 19 is inserted through a hole in the toilet bowl defined by a wall with a concealed opening on one side with a support surface for the anchor member 21 and a support surface for the collar member 22 on the opposite side. The wall being sandwiched between the anchor member 21 and the collar member 22. The leg members 20 are used to angle the anchor member 21 after it has passed the hole in the toilet bowl, such that it is supported against the concealed surface.

**[0043]** The shaft member 5 is slid sideways into the groove 9, guided by a first protrusion 11 on one end of the shaft member 5 and a complementary first recess 10 in the base member 2. The opposite end of the shaft member 5 interfaces with fastening means 6 in the toilet hinge arrangement 7.

**[0044]** The locking member 8 is slid sideways into the groove 9, guided by a second protrusion 13 on the locking member 8 and a second recess 12 on the base member 2.

**[0045]** The cover 14 is housing the base member 2, the underlay member 16, the locking member 8 and part of the shaft member 5. The part of the shaft member 5, that extends above the cover 14 through an opening in the cover 15 is housed within the toilet hinge arrangement 7. The cover 14 will retain the locking member 8 such that it remains in the locked position. The cover 14 will define what is visible from the outside of the toilet hinge fastening arrangement 1. This will provide an aesthetically pleasing and hygienic toilet hinge fastening arrangement 1.

**[0046]** The toilet hinge fastening arrangement is installed as follows:

- the anchor assembly 19 is installed in the toilet bowl,
- the under lay member 16 is positioned on the surface of the toilet bowl,
- the base member 2 is positioned on the under lay member 16,
- the fastener 3 is inserted through the base member 2, the under lay member 16, the collar member 22 and the anchor member 21,
- the fastener 3 is tightened to secure the base member 2 to the toilet bowl,
- the shaft member 5 is inserted into the groove 9,
- the locking member 8 is inserted into the groove 9,
- the cover 14 is placed,

**[0047]** The toilet hinge fastening arrangement 1 is now ready to support the toilet hinge arrangement 7 and toilet cover assembly 23.

**[0048]** Fig. 5 is a detailed view of a second embodiment of the invention. The view shows part of the base member 2, which include the groove 9, and the locking member 8

respectively. The locking member 8 has two third protrusions 18 which will extend into two complementary recesses 17 in the base member 2 when the locking member is in the locked position. The protrusions 17 and recesses 18 will cooperate in keeping the locking member 8 in the locked position. The first 10 and second 12 recesses are coinciding.

**[0049]** Fig. 6 is a detailed view of a third embodiment of the invention. The view shows part of the base member 2, which include the groove 9, and the locking member 8 respectively. The base member 2 has a second recess 12 which is substantially parallel to a centreline through the shaft member 5 (not shown). The locking member has a second protrusion 13 which is complementary to the second recess 12. The locking member 8 is inserted into the groove 9 from above. The movement is substantially perpendicular to the direction in which the shaft member 5 (not shown) is inserted into the groove 9. The locking member 8 will be maintained in the locking position by gravity. This embodiment is able to withstand large sideways forces of the shaft member 5 (not shown).

## Claims

### 1. Toilet hinge fastening arrangement (1) comprising;

- a base member (2) having a lower face adapted to abut an upper face of a toilet bowl,
- a fastener (3) for securing the base member (2) to the toilet bowl through a mounting hole (4) in said base member (2),
- a shaft member (5) extending upwardly from the base member (2) and adapted to interface with fastening means (6) in a toilet hinge arrangement (7),
- a locking member (8) adapted to secure the shaft member (5) to the base member (2), **characterised in that** the shaft member (5) is releasably retained in a groove (9) provided in the base member (2), said groove (9) having either a first recess (10) or a first protrusion (11) which is respectively adapted to cooperate with a complementary first protrusion (11) or a first recess (10) on the shaft member (5) to secure the shaft member (5) to the base member (2), that the locking member (8) is adapted to be inserted into the groove (9), said groove (9) having either a second recess (12) or a second protrusion (13) which is respectively adapted to cooperate with a complementary second protrusion (13) or second recess (12) on the locking member (8) and providing a locked position for the locking member (8) where the shaft member (5) is retained.

### 2. Toilet hinge fastening arrangement according to claim 1, **characterised in that** the first recess (10) and the second recess (12) are coinciding.

### 3. Toilet hinge fastening arrangement according to claim 1, **characterised in that** the second recess (12) is substantially parallel to a centreline through the shaft member (5).

### 4. Toilet hinge fastening arrangement according to any of the preceding claims, **characterised in that** it comprise a cover (14) for housing the base member (2) and locking member (8), said cover (14) having an opening (15) for the shaft member (5).

### 5. Toilet hinge fastening arrangement according to any of the preceding claims, **characterised in that** it comprise a resilient underlay member (16) to be placed between the base member (2) and a toilet bowl.

### 6. Toilet hinge fastening arrangement according to any of the preceding claims, **characterised in that** the base member (2) and the locking member (8) includes a corresponding third recess (17) and third protrusion (18), where the third protrusion (18) extends into the third recess (17) when the locking member (8) is in the locked position.

### 7. Toilet hinge fastening arrangement according to claim 6, **characterised in that** the third recess (17) is provided in the base member (2) and the third protrusion (18) is provided on the locking member (8).

### 8. Toilet hinge fastening arrangement according to claim 7, **characterised in that** the third recess (17) is provided in the locking member (8) and the third protrusion (18) is provided on the base member (2).

### 9. Toilet hinge fastening arrangement according to any of the preceding claims, **characterised in that** it comprise an anchor assembly (19) for retaining the fastener (3), said anchor assembly (19) being adapted to be inserted within an opening in the toilet bowl with a wall portion and a concealed side, said anchor assembly (19) comprises two elongated leg members (20), a threaded anchor member (21) coupled to said leg members (20) at opposite end portions and a collar member (22) secured to said leg members (20) for sandwiching said wall portion between said collar (22) and said anchor member (21).

## Patentansprüche

### 1. Toilettenscharnier-Befestigungsanordnung (1), die umfasst:

- ein Basiselement (2) mit einer unteren Fläche, die dafür ausgelegt ist, auf einer oberen Fläche einer Toilettenschüssel aufzuliegen,
- eine Befestigungseinrichtung (3) zum Befesti-

gen des Basiselements (2) an der Toilettenschüssel durch ein Montageloch (4) in dem Basiselement (2),

- ein Schaftelement (5), das sich von dem Basiselement (2) nach oben erstreckt und dafür ausgelegt ist, mit Befestigungsmitteln (6) in einer Toilettenscharnieranordnung (7) zu koppeln,
- ein Verriegelungselement (8), das dafür ausgelegt ist, das Schaftelement (5) an dem Basiselement (2) zu befestigen,

**dadurch gekennzeichnet, dass** das Schaftelement (5) in einer Nut (9), die in dem Basiselement (2) vorgesehen ist, lösbar gehalten wird, wobei die Nut (9) entweder eine erste Aussparung (10) oder einen ersten Vorsprung (11) besitzt, die bzw. der dafür ausgelegt ist, mit einem komplementären ersten Vorsprung (11) bzw. einer komplementären ersten Aussparung (10) an dem Schaftelement (5) zusammenzuwirken, um das Schaftelement (5) an dem Basiselement (2) zu befestigen, und dass das Verriegelungselement (8) dafür ausgelegt ist, in die Nut (9) eingesetzt zu werden, wobei die Nut (9) entweder eine zweite Aussparung (12) oder einen zweiten Vorsprung (13) besitzt, die bzw. der dafür ausgelegt ist, mit einem komplementären zweiten Vorsprung (13) bzw. einer komplementären zweiten Aussparung (12) an dem Verriegelungselement (8) zusammenzuwirken, um eine verriegelte Position für das Verriegelungselement (8) zu schaffen, in der das Schaftelement (5) gehalten wird.

2. Toilettenscharnier-Befestigungsanordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** die erste Aussparung (10) und die zweite Aussparung (12) übereinstimmen.
3. Toilettenscharnier-Befestigungsanordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** die zweite Aussparung (12) zu einer Mittellinie durch das Schaftelement (5) im Wesentlichen parallel ist.
4. Toilettenscharnier-Befestigungsanordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** sie eine Abdeckung (14) umfasst, um das Basiselement (2) und das Verriegelungselement (8) aufzunehmen, wobei die Abdeckung (14) eine Öffnung (15) für das Schaftelement (5) besitzt.
5. Toilettenscharnier-Befestigungsanordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** sie ein elastisches Unterlagelement (16) umfasst, das zwischen dem Basiselement (2) und einer Toilettenschüssel anzuordnen ist.
6. Toilettenscharnier-Befestigungsanordnung nach einem der vorhergehenden Ansprüche, **dadurch ge-**

**kennzeichnet, dass** das Basiselement (2) und das Verriegelungselement (8) eine entsprechende dritte Aussparung (17) und einen dritten Vorsprung (18) aufweisen, wobei sich der dritte Vorsprung (18) in die dritte Aussparung (17) erstreckt, wenn sich das Verriegelungselement (8) in der verriegelten Position befindet.

7. Toilettenscharnier-Befestigungsanordnung nach Anspruch 6, **dadurch gekennzeichnet, dass** die dritte Aussparung (17) in dem Basiselement (2) vorgesehen ist und der dritte Vorsprung (18) an dem Verriegelungselement (8) vorgesehen ist.
8. Toilettenscharnier-Befestigungsanordnung nach Anspruch 7, **dadurch gekennzeichnet, dass** die dritte Aussparung (17) in dem Verriegelungselement (8) vorgesehen ist und der dritte Vorsprung (18) an dem Basiselement (2) vorgesehen ist.
9. Toilettenscharnier-Befestigungsanordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** sie eine Verankerungsanordnung (19) umfasst, um die Befestigungseinrichtung (3) zu halten, wobei die Verankerungsanordnung (19) dafür ausgelegt ist, in eine Öffnung in der Toilettenschüssel eingesetzt zu werden und einen Wandabschnitt und eine verdeckte Seite aufweist, wobei die Verankerungsanordnung (19) zwei lang gestreckte Schenkelemente (20), ein Gewindeverankerungselement (21), das mit den Schenkelementen (20) an gegenüberliegenden Endabschnitten gekoppelt ist, und ein Kranzelement (22), das an den Schenkelementen (20) so befestigt ist, dass der Wandabschnitt zwischen dem Kranz (22) und dem Ankerelement (21) enthalten ist, umfasst.

## Revendications

1. Dispositif de fixation pour charnière de toilettes (1) comprenant;
  - un élément de base (2) ayant une face inférieure destinée à venir en contact avec une face supérieure d'une cuvette de toilettes,
  - un élément de fixation (3) pour fixer l'élément de base (2) à la cuvette de toilettes à travers un trou de montage (4) dans ledit élément de base (2),
  - un élément d'arbre (5) s'étendant vers le haut à partir de l'élément de base (2) et adapté pour servir d'interface avec des moyens de fixation (6) dans un agencement de charnière de toilette (7),
  - un élément de verrouillage (8) conçu pour fixer l'élément d'arbre (5) à l'élément de base (2),

- caractérisé en ce que** l'élément d'arbre (5) est retenu de manière amovible dans une rainure (9) prévue dans l'élément de base (2), ladite rainure (9) ayant soit un premier évidement (10) ou une première saillie (11) qui est respectivement conçue pour coopérer avec une première saillie (11) complémentaire ou un premier évidement (10) sur l'élément d'arbre (5) pour fixer l'élément d'arbre (5) à l'élément de base (2), que l'élément de verrouillage (8) est adapté pour être inséré dans la rainure (9), ladite rainure (9) ayant soit un second évidement (12) ou une seconde saillie (13) qui est respectivement conçue pour coopérer avec une deuxième saillie (13) complémentaire ou second évidement (12) sur l'élément de verrouillage (8) et fournissant une position verrouillée de l'élément de verrouillage (8) où l'élément d'arbre (5) est retenu.
2. Dispositif de fixation pour charnière de toilettes selon la revendication 1, **caractérisé en ce que** le premier évidement (10) et le second évidement (12) sont coïncidents.
3. Dispositif de fixation pour charnière de toilettes selon la revendication 1, **caractérisé en ce que** le deuxième évidement (12) est sensiblement parallèle à une ligne centrale à travers l'élément d'arbre (5).
4. Dispositif de fixation pour charnière de toilettes selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'il** comprend un couvercle (14) pour loger l'élément de base (2) et l'élément de verrouillage (8), ledit couvercle (14) ayant une ouverture (15) pour l'élément d'arbre (5).
5. Dispositif de fixation pour charnière de toilettes selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'il** comprend un élément sous-jacent élastique (16) à être placé entre l'élément de base (2) et une cuvette de toilettes.
6. Dispositif de fixation pour charnière de toilettes selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'élément de base (2) et l'élément de verrouillage (8) comprend un troisième évidement (17) et troisième saillie (18) correspondants, où la troisième saillie (18) s'étend dans le troisième évidement (17) lorsque l'élément de verrouillage (8) est dans la position verrouillée.
7. Dispositif de fixation pour charnière de toilettes selon la revendication 6, **caractérisé en ce que** le troisième évidement (17) est prévu dans l'élément de base (2) et la troisième saillie (18) est prévue sur l'élément de verrouillage (8).
8. Dispositif de fixation pour charnière de toilettes selon la revendication 7, **caractérisé en ce que** le troisième
- me évidement (17) est prévu dans l'élément de verrouillage (8) et la troisième saillie (18) est prévue sur l'élément de base (2).
9. Dispositif de fixation pour charnière de toilettes selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'il** comprend un ensemble d'ancrage (19) pour retenir l'élément de fixation (3), ledit ensemble d'ancrage (19) étant adapté à être inséré à l'intérieur d'une ouverture dans le cuvette de toilettes à l'aide d'une partie de paroi et d'une face cachée, ledit ensemble d'ancrage (19) comprend deux éléments de branche allongés (20), un élément d'ancrage fileté (21) couplé auxdits éléments de branche (20) au niveau des parties d'extrémité opposées et un élément de collier (22) fixé sur lesdits éléments de branche (20) pour prendre en sandwich ladite partie de paroi entre ledit collier (22) et ledit élément d'ancrage (21).

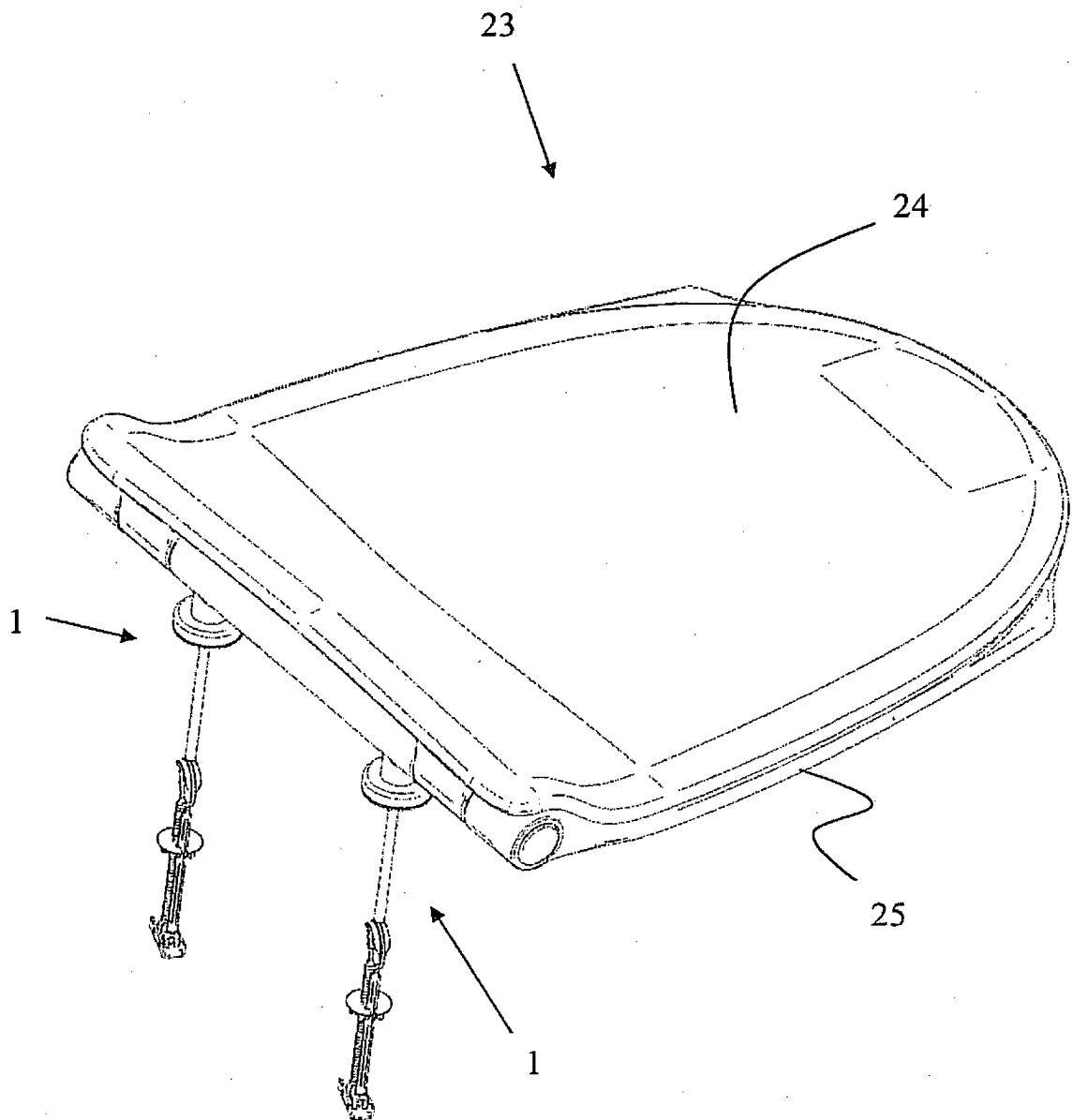


Fig. 1

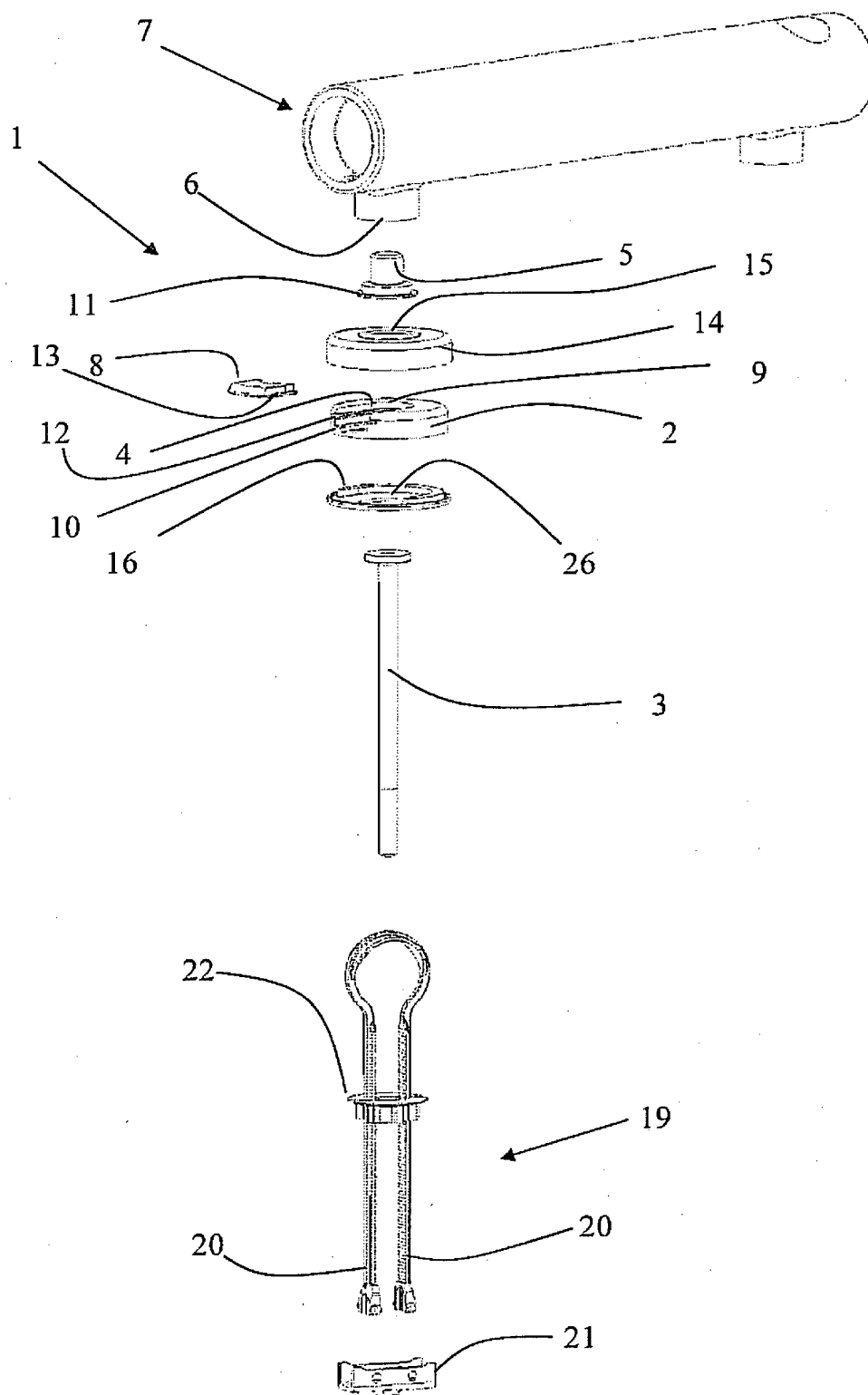


Fig. 2

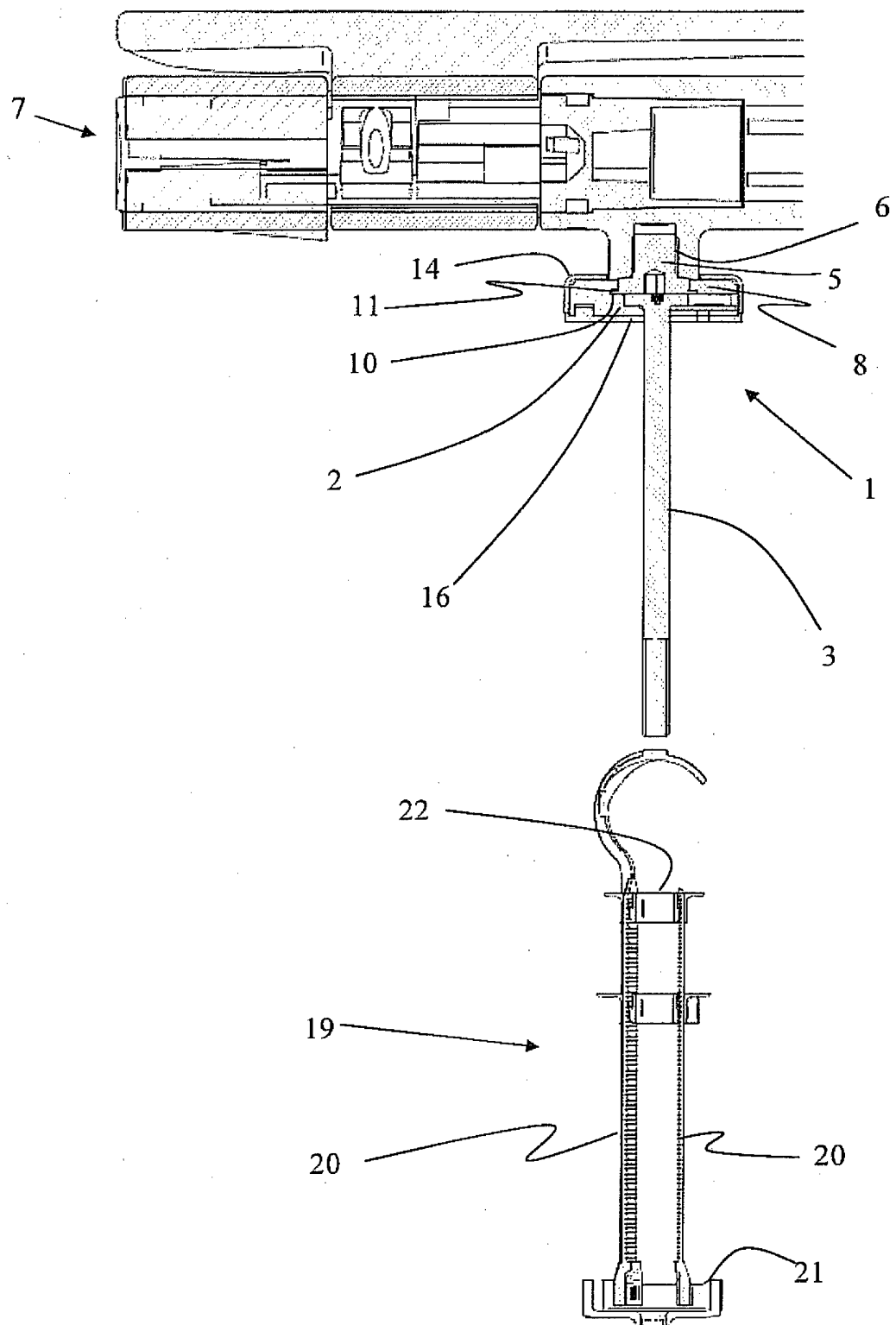


Fig. 3

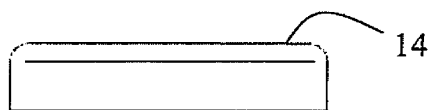


Fig. 4a

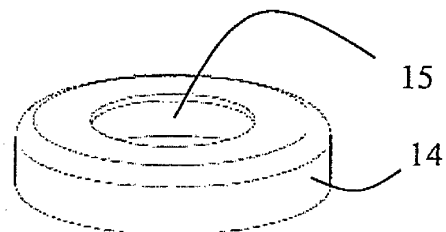


Fig. 4b



Fig. 4c



Fig. 4d

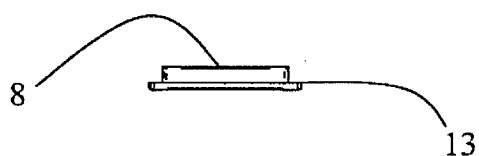


Fig. 4e

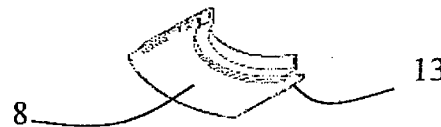


Fig. 4f

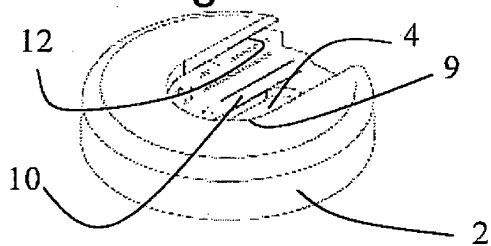


Fig. 4g

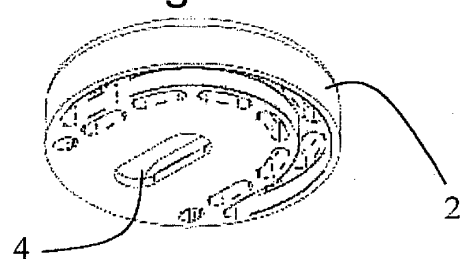


Fig. 4h

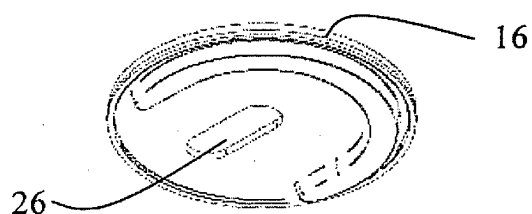


Fig. 4i

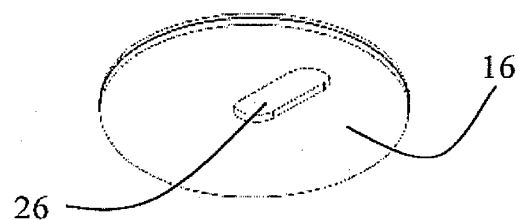


Fig. 4j

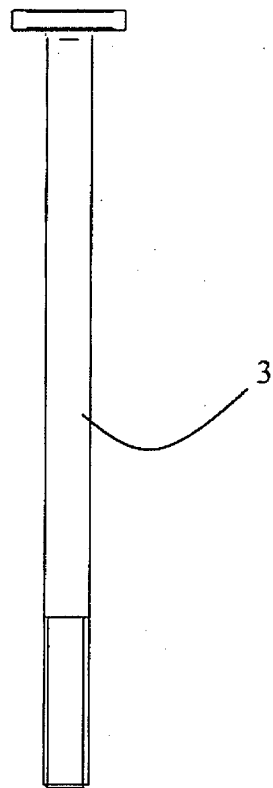


Fig. 4k

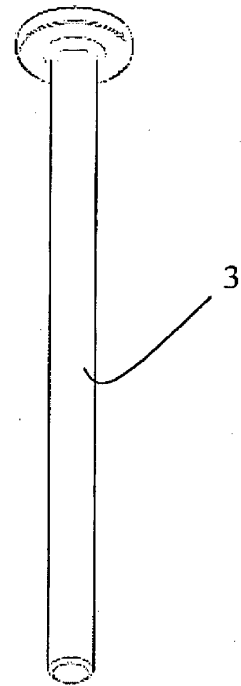


Fig. 4l

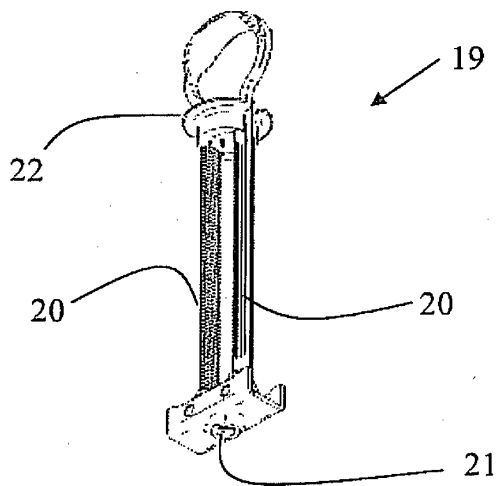


Fig. 4m

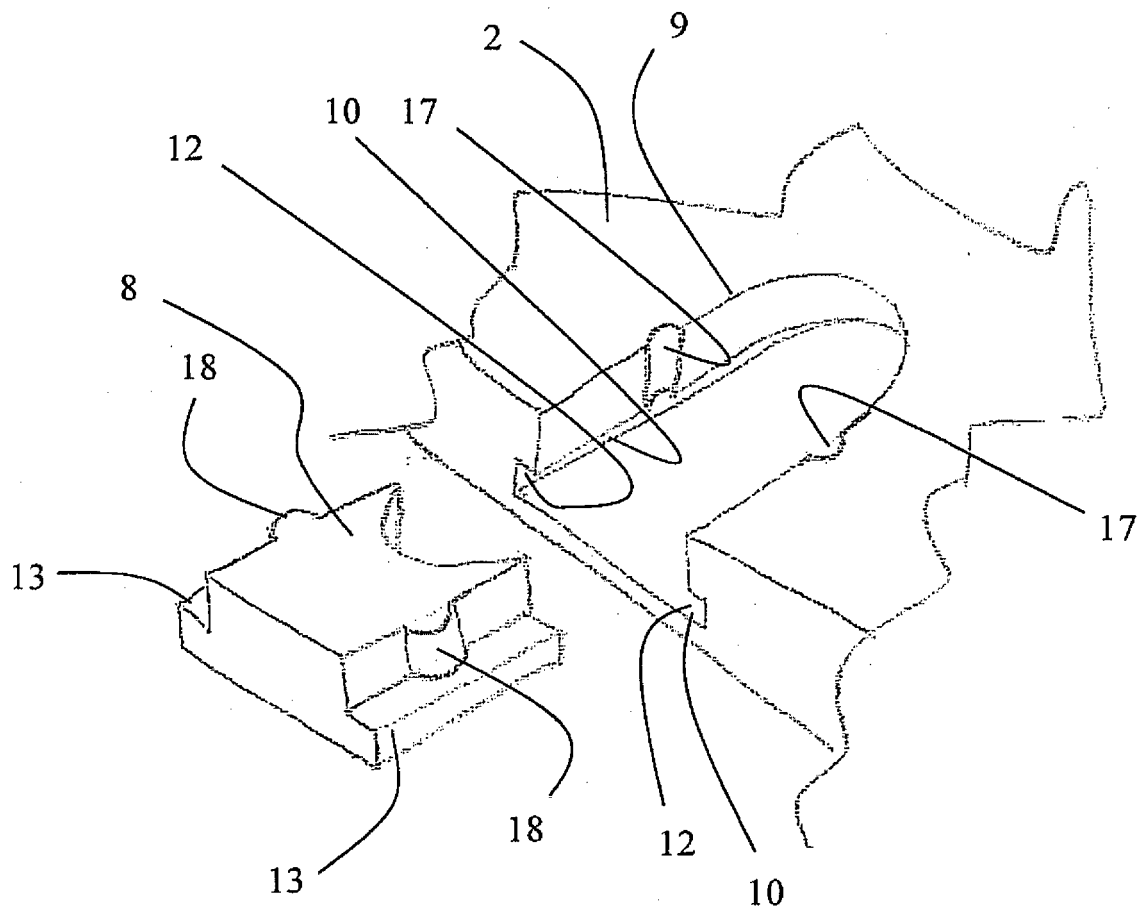


Fig. 5

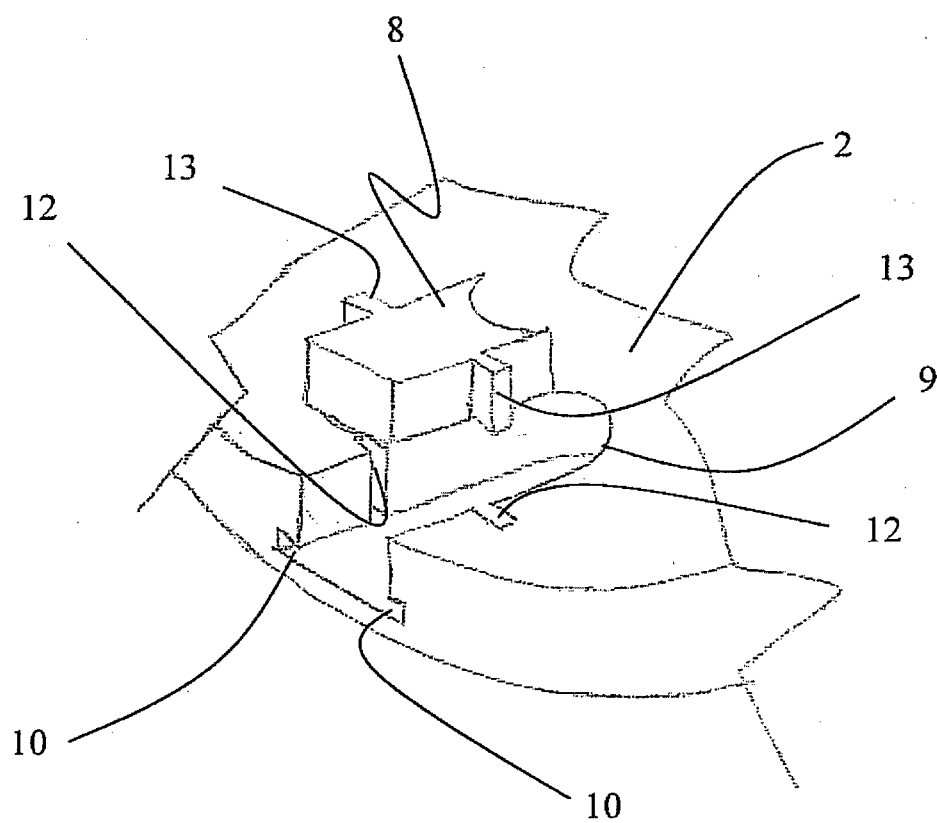


Fig. 6

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- WO 9111950 A1 [0002]
- US 5933875 A [0003]