

Description

[0001] The present invention relates to a coupling hinge, in particular a coupling hinge for seats and covers of hygienic bowl.

[0002] As known, seats and covers for closing hygienic bowl are hinged to the hygienic bowl by hinges that allow rotating the seat or cover relative to the bowl from a horizontal closed position, resting on a support surface of the bowl, to a substantially vertical open position, wherein the seat or cover forms an angle not smaller than 90 degrees with said support surface.

[0003] Seats and covers, when in vertical open position, abut at about 90 degrees relative to the support surface of the seat, usually against the wall the hygienic bowl is fit to. It is not infrequent that seat or cover, subsequent to small movements, may heavily fall on the bowl with the risk of damaging the bowl itself.

[0004] Prior art solutions of hinges are known, which envisage means for damping the movement of rotation of the seat or cover, so as to cushion the movement of fall back of the cover or seat on the bowl. Such prior art solutions envisage the use of hinges that comprise viscous liquids arranged inside the hinges for obtaining a damping effect.

[0005] However, such solutions of the prior art are cumbersome, complex and expensive to be manufactured as they envisage the use of special liquid containment chambers and relevant hydraulic seals. Moreover, such hinges are unavoidably subject to liquid leaks over time, with consequent soiling of the bowl and inefficacy of the damping system.

[0006] The problem of the present invention is to provide a hinge which should solve the disadvantages mentioned with reference to the prior art.

[0007] Such disadvantages are solved with a hinge in accordance with claim 1.

[0008] Other embodiments of the hinge according to the invention are described in the subsequent claims.

[0009] Further features and the advantages of the present invention will appear more clearly from the following description of a preferred non-limiting embodiment, wherein:

[0010] figure 1 shows a side view of a hinge according to an embodiment of the present invention;

[0011] figure 2 shows a section view of the hinge of figure 1, along the section line II-II of figure 1;

[0012] figure 3 shows an exploded perspective view of the hinge of figure 1;

[0013] figure 4 shows a section view of the hinge of figure 1, along the section line IV-IV of figure 1, in a first operating position;

[0014] figure 5 shows a section view of the hinge of figure 1, along the section line IV-IV of figure 1, in a second operating position;

[0015] figure 6 shows an application of the hinge of figure 1 to a hygienic bowl in a first operating position;

[0016] figure 7 shows an application of the hinge of

figure 1 to a hygienic bowl in a second operating position.

[0017] With reference to the above figures, reference numeral 4 generically denotes a coupling hinge for a hygienic bowl 8, suitable for obtaining a rotary coupling along a first axis of rotation (X-X) between a hygienic bowl 8 and a seat 12 or cover 14 associated thereto. In particular, cover 14 or seat 12 can rotate from a closed position wherein they abut against a support surface 16 of the hygienic bowl 8 to an open position wherein said seat or cover form an angle not smaller than 90 degrees with support surface 16.

[0018] According to an embodiment, hinge 4 comprises a first coupling element 20, suitable for being integrally constrained in rotation to said seat or cover 12, 14 so as to rotate with the seat or cover, and a second coupling element 24 suitable for being integrally constrained to said hygienic bowl 8 so as to not rotate relative to said first axis of rotation X-X.

[0019] According to an embodiment, hinge 4 comprises a guiding element 30 fixed relative to said first axis of rotation X-X, and having a guiding portion 34 defining at least one cam profile 38.

[0020] The first coupling element 20 comprises a cup portion 42 at least partly fit on said guiding portion 34 and comprising contrast means 46 suitable for abutting against said guiding cam profile 38 and for following said profile in the movement of rotation of the first coupling element 20, so as to oppose the rotation of said first coupling element 20.

[0021] According to an embodiment, the cup portion 42 comprises at least one seat 48 suitable for turnably seating said contrast means 46 relative to a second axis of rotation Y-Y, parallel to said first axis of rotation X-X.

[0022] The contrast means may comprise at least one roll 50 turnably seated in said seat 48 so as to protrude from said seat 48 radially, that is, relative to a direction incident with the second axis of rotation Y-Y and contained in a plane perpendicular to the second axis of rotation Y-Y, so as to abut against said guiding cam profile 38.

[0023] Preferably, the cup portion 42 comprises three seats 48 and three corresponding rolls 50 arranged angularly at a pitch relative to said first axis of rotation; in other words, preferably the rolls and the respective seats are arranged at 120 degree relative to said first axis of rotation X-X.

[0024] The first coupling element 20 comprises, opposite said cup portion 42, a coupling head 54 suitable for being integrally connected in rotation to said seat or cover 12, 14. For example, said coupling head 54 may be inserted in a pin 55 for connecting the seat or cover 12, 14 to bowl 8.

[0025] Preferably, the coupling head 54 comprises at least one levelling 56 suitable for favouring the connection in rotation between the first coupling element 20 and the seat or cover 12, 14.

[0026] The guiding portion 34 comprises at least one cam profile 38, said profile 38 having a curvilinear pattern

from a portion of maximum radial distance 60 relative to the first axis of rotation X-X to a portion of minimum radial distance 64 from the first axis of rotation X-X.

[0027] Preferably, the portion of maximum radial distance 60, in an assembled configuration wherein the cup portion 42 is at least partly fit on said guiding portion 34, touches an inside diameter of the cup portion 42.

[0028] At said portion of minimum radial distance 64 the cam profile 38 comprises a rise 68 that is jointed to the portion of maximum radial distance 64 of an adjacent profile 38; said rise 68 determines a stop position for said contrast means 46.

[0029] The guiding element 30 preferably comprises a shoulder 72, axially opposite the guiding portion 34, so as to stop the axial introduction of the cup portion 42 on the guiding portion 34.

[0030] Preferably, shoulder 72 is coaxial with said guiding portion 34.

[0031] According to an embodiment, the guiding element 30 comprises, opposite shoulder 72 relative to the guiding portion 34, a pin 76 suitable for being at least partly seated in a cavity 75 of said first coupling element 20, so as to coaxially centre the guiding element 30 relative to the first coupling element 20.

[0032] According to an embodiment, said hinge 4 comprises a collar 80, preferably elastic, suitable for being fitted coaxially to the first axis of rotation X-X, on the guiding portion 34, so as to arrange in contact with said contrast means 46, the contrast elements 46 being arranged between the guiding element 30 and collar 80.

[0033] Preferably, collar 80 has such axial extension as to be fitted on both the guiding portion 34 and shoulder 72.

[0034] According to an embodiment, collar 80 is fitted with interference on the guiding portion 34 and on shoulder 72.

[0035] Preferably, the elastic collar 80 has a radial thickness at least equal to the difference of radial thickness between the contrast means 46 and the cup portion 42.

[0036] According to an embodiment, the elastic collar 80 is of polymeric material.

[0037] According to an embodiment, the second coupling element comprises a coating 84, suitable for coating said first coupling element 20.

[0038] The coating preferably has such inside diameter as to be fitted with interference on said collar 80 so as to lock in rotation the guiding element 30 relative to the first axis of rotation X-X.

[0039] Preferably, coating 84 comprises a coupling hole 88 suitable for allowing the passage of a pin 90 for obtaining a mechanical connection between a fixing portion of said hygienic bowl and said hinge 4.

[0040] Preferably, said guiding element 30 comprises a fixing hole 92 suitable for allowing the introduction and locking of said pin 90, so as to lock in rotation the guiding element 30 relative to the hygienic bowl 8.

[0041] The assembly of a hinge according to the

present invention will now be described.

[0042] In particular, in order to carry out correct assembly, the roll position must be calibrated relative to the guiding portion so as to ensure correct stops of the opening and closing movement of the seat or cover relative to the bowl.

[0043] In particular, if the hinge is mounted with the cover in open position, that is, in a position wherein the cover forms an angle of at least 90 degrees with the bowl, and preferably an angle comprised between 90 and 120 degrees, the rolls must be substantially positioned at the recesses of the guiding portion (figure 4).

[0044] In this way, in the subsequent movement of descent or closing of the cover or seat, the space between the rolls and the guiding portion decreases and therewith the friction action between rolls and guiding element itself. In other words, by increasing the travel of the seat or cover, that is, reducing the opening angle of the seat or cover, the latter undergoes an increasing braking action as the closed position approaches (figure 5).

[0045] During the opening movement, the rolls act on the collar radially compressing it; the elastic return action of the collar favours the rotation itself of the seat or cover, so as to make the movement of rotation of the cover or seat as even as possible.

[0046] According to further embodiments, it is possible to select such cam profiles as to exert a damping action by friction with the rolls only in limited portions of the rotation travel of the seat or cover. In other words, the cam profile 38 may comprise a portion that exerts no friction or interference action with the contrast means 46 by a first portion of the travel of the seat or cover and then it exerts a contrast action only in the last travel portion. In particular, at such portion that exerts no friction or interference the profile may have such radial distance from the first axis of rotation as to prevent contact between the contrast means and profile 38 of the guiding portion 34.

[0047] In this way, it is possible to dampen the movement of the seat or cover only at the stops when opening and/or closing the seat or cover itself.

[0048] As it can be understood from the description, the hinge according to the present invention allows overcoming the disadvantages of the hinges of the prior art.

[0049] In particular, the hinge according to the present invention is simple and inexpensive to manufacture.

[0050] Advantageously, it is possible to select different cam profiles and polymeric materials for the collar so as to calibrate the hinge for seats or covers having different weights.

[0051] Moreover, the hinge of the present invention is not subject to any loss of inside liquids since it is provided with no hydraulic damping system of the movement of rotation.

[0052] Moreover, the hinge of the present invention exhibits limited overall dimensions and may be easily applied also to existing hygienic bowl, without interfering with the bowl, the seat or the cover in any way.

[0053] The damping determined by friction by the present hinge allows the movement of fall back of the seat or cover to be perfectly controlled preventing any violent collision with the hygienic bowl.

[0054] A man skilled in the art may make several changes and adjustments to the hinges described above in order to meet specific and incidental needs, all falling within the scope of protection defined in the following claims.

Claims

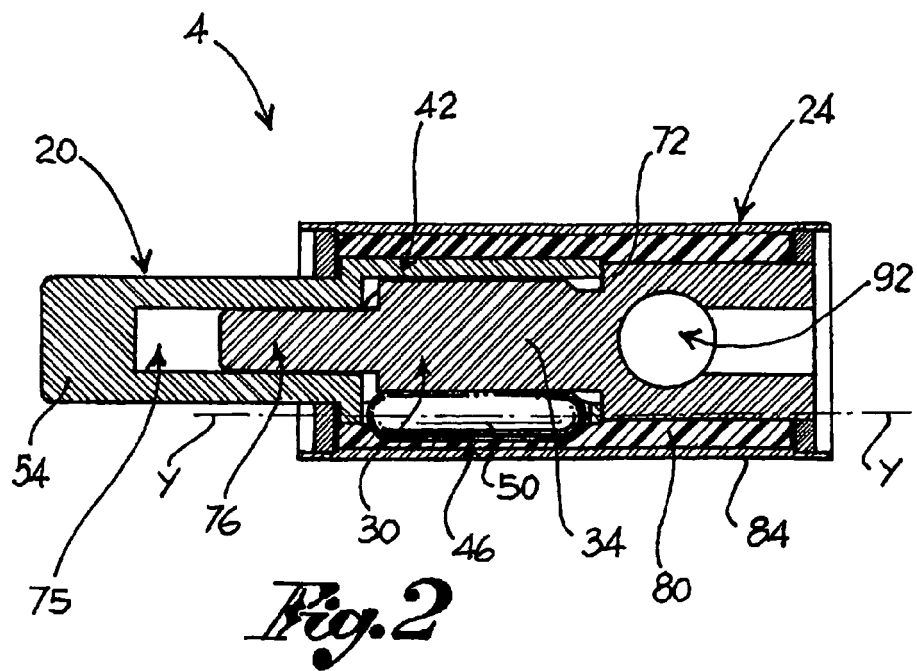
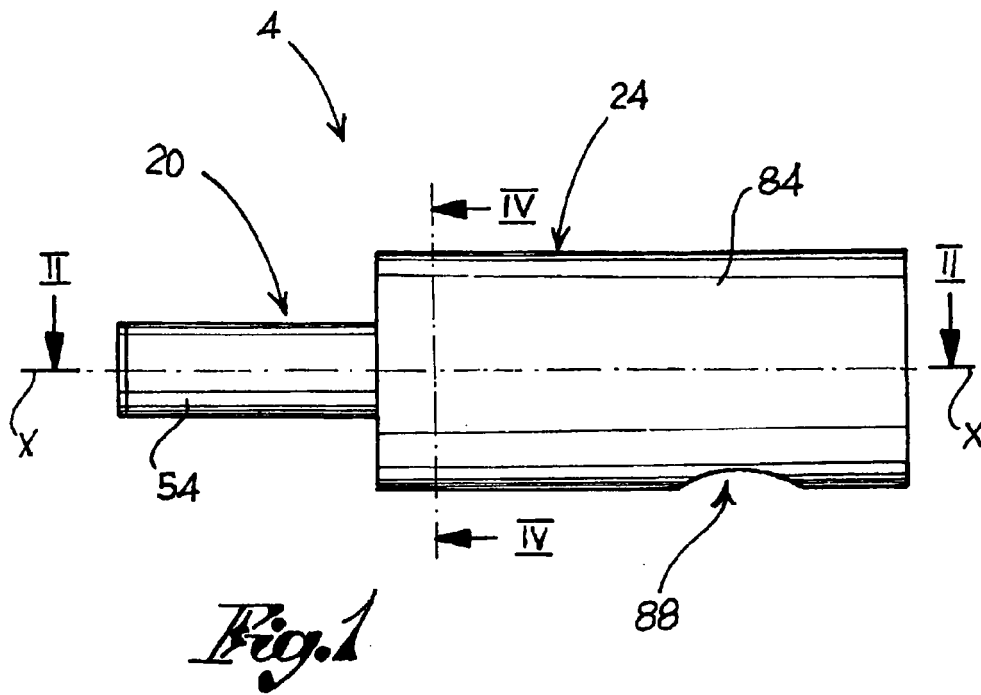
1. A coupling hinge (4) for hygienic bowl, suitable for obtaining a rotary coupling along a first axis of rotation (X-X) between a hygienic bowl (8) and a seat or cover (12, 14) associated thereto, comprising
a first coupling element (20), suitable for being integrally constrained in rotation to said seat or cover (12, 14),
a second coupling element (24) suitable for being constrained to said hygienic bowl (8) so as not to rotate relative to said first axis of rotation (X-X),
characterised in that
the hinge (4) comprises a guiding element (30) fixed relative to said first axis of rotation (X-X), and having a guiding portion (34) defining a cam profile (38), the first coupling element (20) comprises a cup portion (42) at least partly fit on said guiding portion (34) and comprising contrast means (46) suitable for abutting against said guiding cam profile (38) and for following said profile in the movement of rotation of the first coupling element (20), so as to oppose the rotation of said first coupling element (20).
2. A hinge according to claim 1, wherein said cup portion (42) comprises at least one seat (48) suitable for turnably seating said contrast means (46) relative to a second axis of rotation (Y-Y), parallel to said first axis of rotation (X-X).
3. A hinge (4) according to claim 2, wherein said contrast means (46) comprise at least one roll (50) turnably seated in said seat (48) so as to protrude from said seat (48) radially, relative to a direction incident with the second axis of rotation (Y-Y) and contained in a plane perpendicular to the second axis of rotation (Y-Y), so as to abut against said guiding cam profile (38).
4. A hinge (4) according to any one of the previous claims, wherein said cup portion (42) comprises three seats (48) and three corresponding rolls (50) arranged angularly at a pitch relative to said first axis of rotation (X-X).
5. A hinge (4) according to claim 4, wherein the rolls (50) and the respective seats (48) are arranged at 120 degrees relative to said first axis of rotation (X-X).
6. A hinge (4) according to any one of the previous claims, wherein said first coupling element (20) comprises, opposite said cup portion (42), a coupling head (54) suitable for being integrally connected in rotation to said seat or cover (12, 14).
7. A hinge (4) according to claim 6, wherein said coupling head (54) comprises at least one levelling (56) suitable for favouring the connection in rotation between the first coupling element (20) and the seat or cover (12, 14).
8. A hinge (4) according to any one of the previous claims, wherein said guiding portion (34) comprises at least one cam profile (38), said profile (38) having a curvilinear pattern from a portion of maximum radial distance (60) relative to the first axis of rotation (X-X) to a portion of minimum radial distance (64) from the first axis of rotation (X-X).
9. A hinge (4) according to claim 8, wherein said portion of maximum radial distance (60), in an assembled configuration wherein the cup portion (42) is at least partly fit on said guiding portion (34), touches an inside diameter of the cup portion (42).
10. A hinge (4) according to any one of claims 8 to 9, wherein at said portion of minimum radial distance (64) said cam profile (38) comprises a rise (68) that is jointed to the portion of maximum radial distance (60) of an adjacent cam profile (38), said rise (68) determining a stop position for said contrast means (46).
11. A hinge (4) according to any one of claims 8 to 10, wherein said cam profiles (38) exerts a damping action by friction with the rolls (50) only in limited portions of the rotation travel of the seat or cover (12, 14).
12. A hinge (4) according to claim 11, wherein the cam profile (38) comprises a portion that exerts no friction or interference action with the contrast means (46) by a first portion of the travel of the seat or cover (12, 14) and it exerts a contrast action in the last travel portion of said seat or cover (12, 14).
13. A hinge (4) according to claim 11 or 12, wherein at such portion that exerts no friction or interference, the profile (38) has such radial distance from the first axis of rotation (X-X) as to prevent contact between the contrast means (48) and the profile (38) of the guiding portion (34).
14. A hinge (4) according to any one of the previous

claims, wherein said guiding element (30) comprises a shoulder (72), axially opposite the guiding portion (34), so as to stop the axial introduction of the cup portion (42) on the guiding portion (34).

15. A hinge (4) according to claim 14, wherein said shoulder (72) is coaxial with said guiding portion (34) relative to the first axis of rotation (X-X). 5
16. A hinge (4) according to any one of the previous claims, wherein said guiding element (30) comprises, opposite shoulder (72) relative to the guiding portion (34), a pin (76) suitable for being at least partly seated in said first coupling element (20), so as to coaxially centre the guiding element (30) relative to the first coupling element (20). 10 15
17. A hinge (4) according to any one of the previous claims, wherein said hinge (4) comprises a collar (80), preferably elastic, suitable for being fitted coaxially to the first axis of rotation (X-X), on the guiding portion (34), so as to arrange in contact with said contrast means (46), the contrast means being arranged between the guiding element (30) and the collar (80). 20 25
18. A hinge (4) according to claim 17, wherein said collar (80) has such extension as to be fitted on the guiding portion (34) and on the shoulder (72). 30
19. A hinge (4) according to claims 17 or 18, wherein said collar (80) is fitted with interference on the guiding portion (34) and on the shoulder (72).
20. A hinge (4) according to any one of claims 17 to 19, wherein the elastic collar (80) has a radial thickness at least equal to the difference of radial thickness between the contrast means (46) and the cup portion (42). 35 40
21. A hinge according to any one of claims 17 to 20, wherein the elastic collar (80) is of polymeric material.
22. A hinge (4) according to any one of the previous claims, wherein the second coupling element (24) comprises a coating (84), suitable for coating said first coupling element (20). 45
23. A hinge (4) according to claim 22, wherein the coating (84) has such inside diameter as to be fitted with interference on said collar (80) so as to lock in rotation the guiding element (30) relative to the first axis of rotation (X-X). 50 55
24. A hinge (4) according to claims 22 or 23, wherein the coating (84) comprises a coupling hole (88) suitable for allowing the passage of a pin (90) for obtain-

ing a mechanical connection between a support plate (16) of said hygienic bowl (8) and said hinge (4).

25. A hinge (4) according to any one of the previous claims, wherein said guiding element (30) comprises a fixing hole (92) suitable for allowing the introduction and locking of a pin (90), so as to lock in rotation the guiding element (30) relative to the hygienic bowl (8).



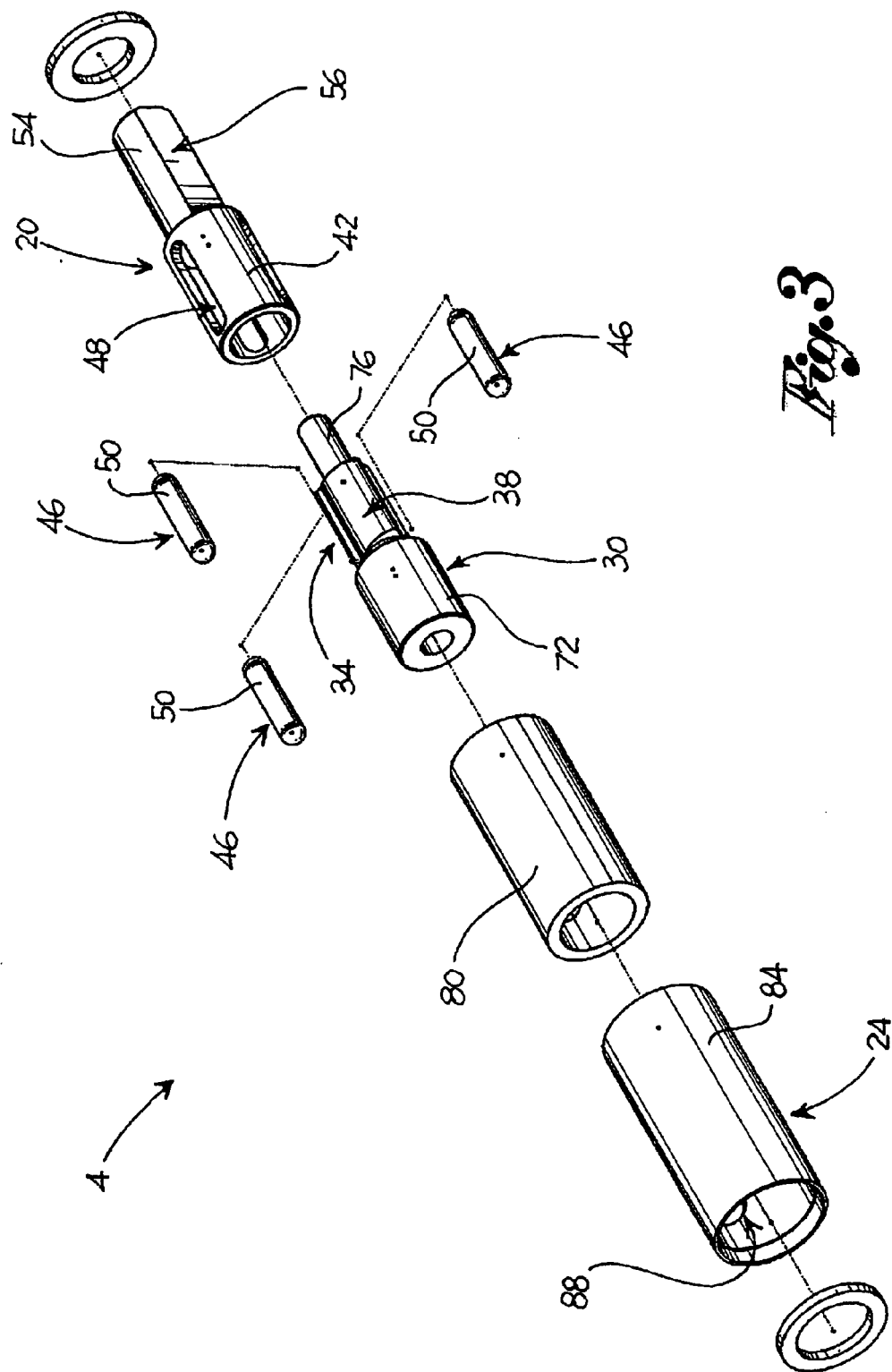


Fig. 3

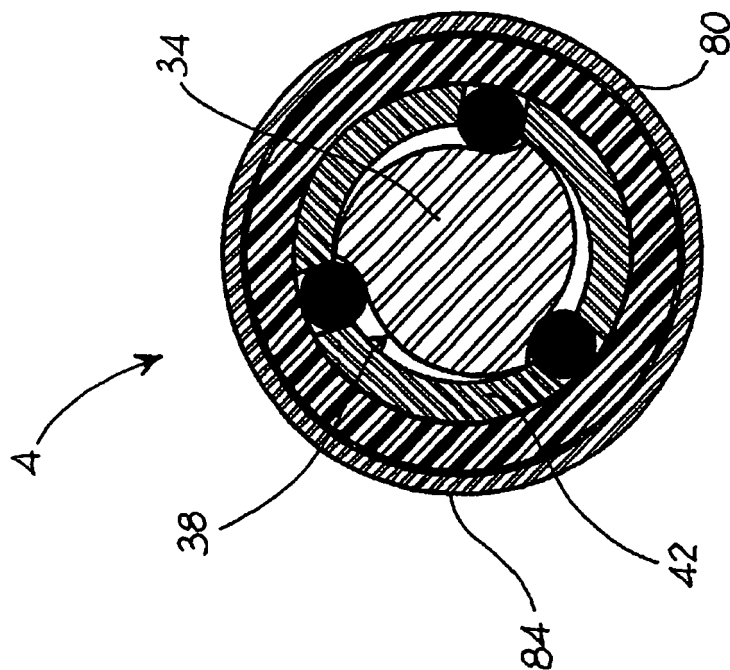


Fig. 4

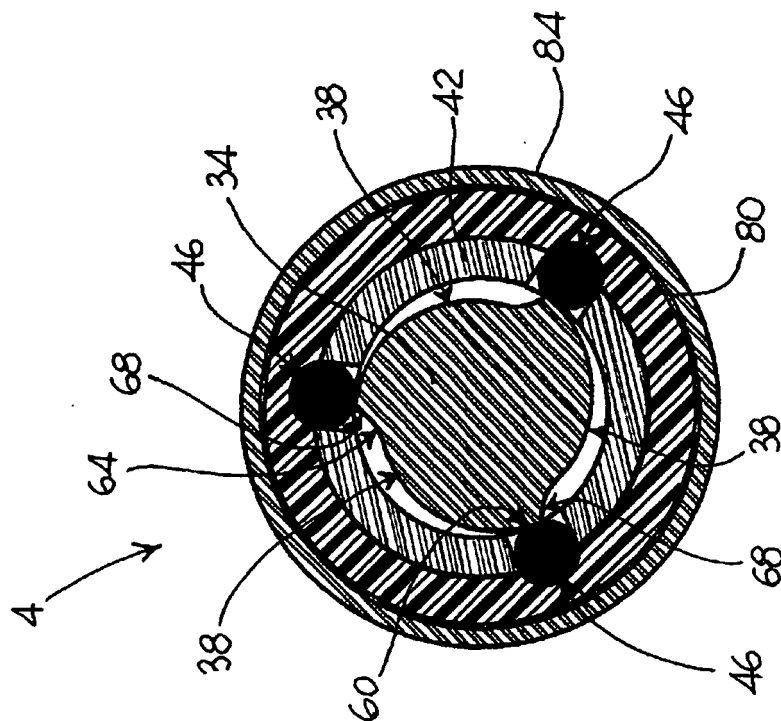


Fig. 5

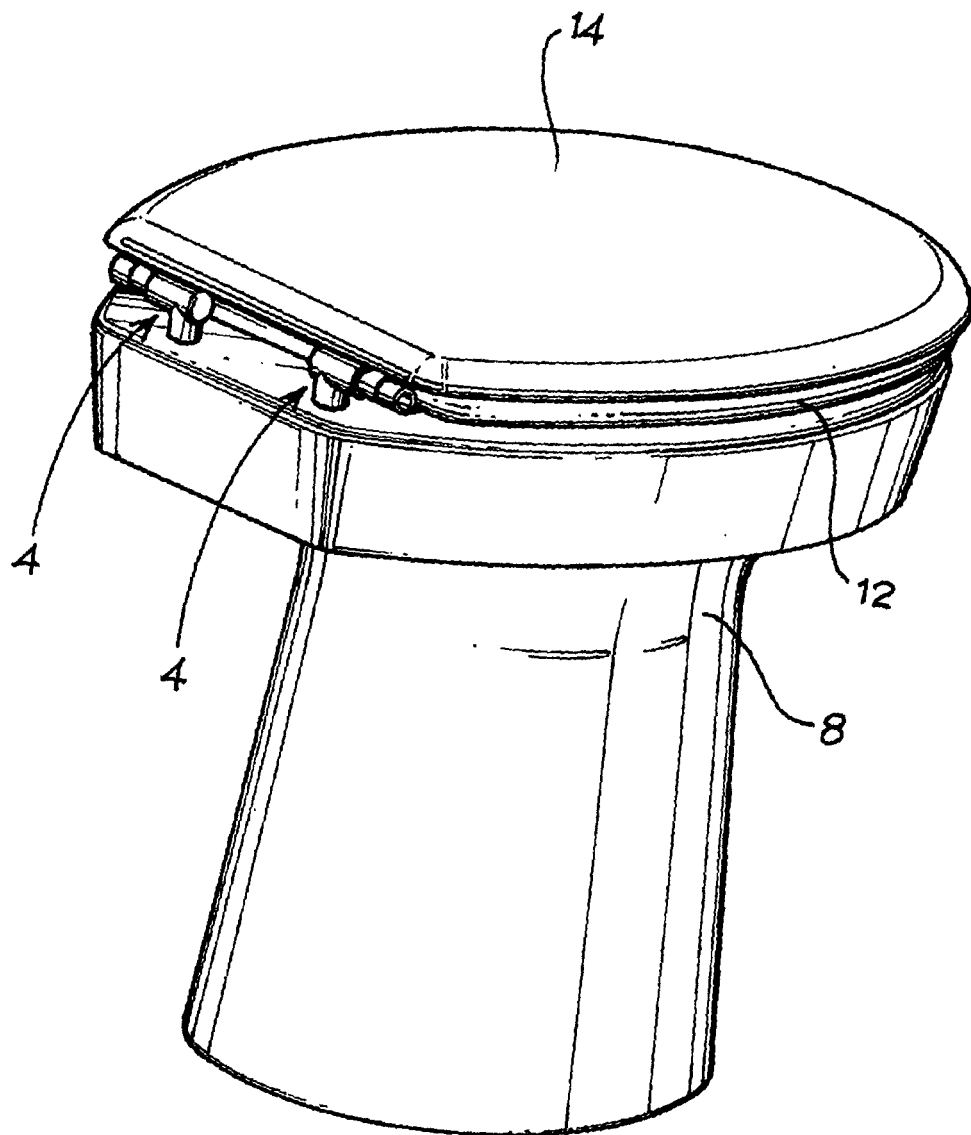


Fig. 6

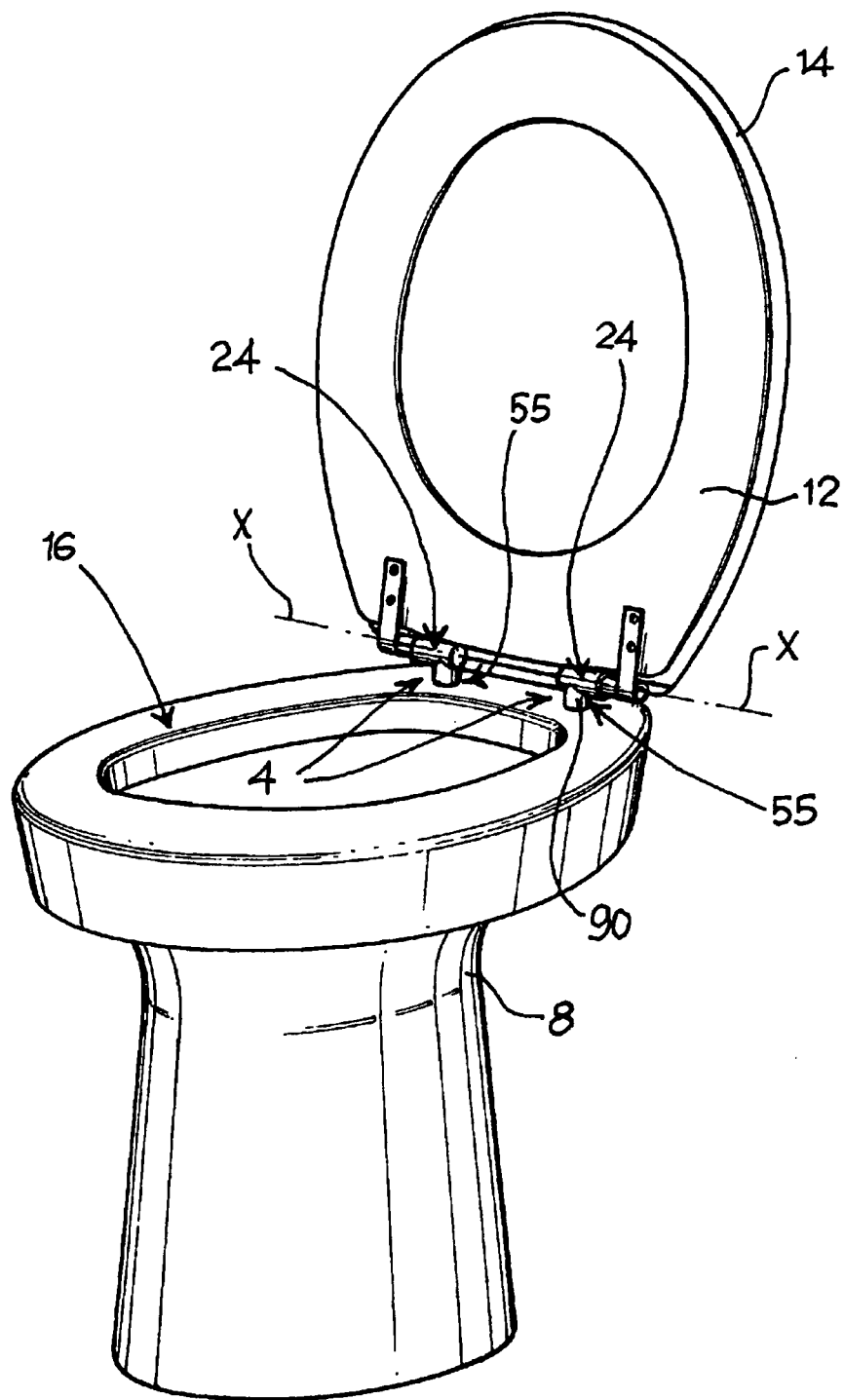


Fig. 7



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 42 5826

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	GB 2 215 393 A (TKD IND LIMITED [GB] TKD IND LIMITED [GB]; PANARAMA SUNROOFS LTD [GB];) 20 September 1989 (1989-09-20)	1-12, 14-19	INV. A47K13/12
A	* page 8, paragraph 2 - page 9, paragraph 2; figures 5-8 *	20	
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A	* column 4, line 40 - column 5, line 37; figure 9 *	17-20	
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A	* paragraph [0029] - paragraph [0055]; figures *		
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A	* column 3, line 47 - column 7, line 45; figures 1-3 *		
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A	* column 6, line 4 - line 32; figure 11 *		
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A	* page 2, line 27 - line 68; figures 2,3 *		
A	WO 2005/102137 A (ECZACIBASI YAPI GERECLERI SANA [TR]; ER OSMAN [TR]) 3 November 2005 (2005-11-03)	1	
	* page 3, line 12 - page 4, line 29; claim 12; figures *		
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 31 October 2007	Examiner Fordham, Alan
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 06 42 5826

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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31-10-2007

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