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(54) **Apparatus for cleaning the toilet seat**

(57) Apparatus (1) for hygienizing the seat of a water closet, comprising a frame (2) placed behind the water closet (V), a seat housing (3) obtained on the front side

on the frame and apt to receive and hold the seat (10) in vertical position, and dispensing means (51) of a hygienizing agent comprising a plurality of dispensing lights (41) obtained on the seat housing (Fig.1).

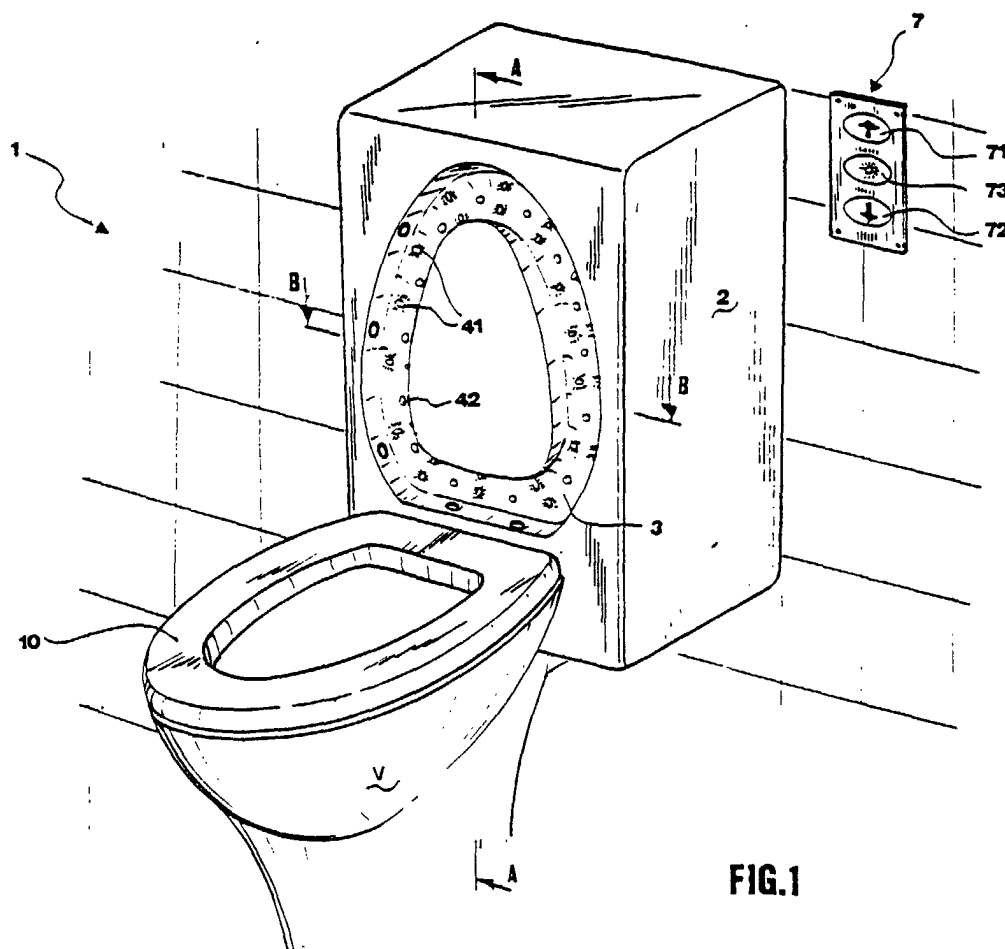


FIG.1

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Description

[0001] The present invention relates to an apparatus for hygienizing the seat of a water closet.

[0002] A known problem of toilets in public places is the hygiene of the corresponding water closets. In fact, the latter are used by many different people and, for this reason, they are often under condition of bad hygiene, resulting dirty and ill-smelling, with clear risks for the public health. Furthermore, even when the water closet seems apparently clean, the users, doubtful about the real hygienic condition thereof, avoid any contact both with the real water closet and with the seat thereof, by using it then in an incorrect way. Said incorrect use not only can result uncomfortable for the user, but often it worsens the hygienic condition of the water closet itself and of the room housing it.

[0003] Recently, some apparatuses for hygienizing the seat have been proposed providing that the latter be sliding horizontally with respect to the water closet, so that it can be brought in a hygienizing chamber. Nevertheless, such apparatuses are of rather complex and expensive construction.

[0004] Therefore, the technical problem underlying the present invention is to provide an apparatus for hygienizing the seat of a water closet alternative to the known art systems and which enable to obviate to the drawbacks mentioned above.

[0005] Such problem is solved by an apparatus according to claim 1.

[0006] According to the same inventive concept, the present invention also refers to a seat for water closet according to claim 18.

[0007] The invention further provides a sanitary kit according to claim 19.

[0008] Preferred features of the present invention are in the dependent claims thereof.

[0009] The present invention provides some advantages. The main advantage lies in the fact that it allows, by simply bringing the seat of the water closet in vertical position, quick and efficient hygienization of the seat itself. In particular, the specific arrangement of the seat housing makes the apparatus of reduced dimensions, of easy and convenient implementation and of simple use.

[0010] Other advantages, features and application modes of the present invention will be evident from the following detailed description of some embodiments, illustrated by way of example and not for limitative purposes. The drawings of the enclosed figures will be referred to, wherein:

figure 1 shows a perspective view of a first embodiment of the apparatus according to the invention;
figure 2 shows a front view of the apparatus of figure 1;

figure 3 shows a longitudinal sectional view of the apparatus of figure 1, taken according to the line

A-A of this latter figure;

figure 3A shows an enlargement of a detail of the apparatus of figure 3;

figure 4 shows a cross-sectional view of the apparatus of figure 1, taken according to the line B-B of this latter figure; and

figure 5 shows an additional longitudinal sectional view of the apparatus of figure 1 upon use.

[0011] By firstly referring to the figures 1 and 2, an apparatus for hygienizing the seat, often called "tablet", of a water closet is designated as a whole with 1.

[0012] The apparatus 1 first of all comprises a frame 2 apt to be fastened to a wall of the room housing the water closet V, behind the latter. The frame 2 in turn comprises an outer casing, designated too with 2, apt to house additional components of the apparatus 1. Preferably, such casing has an upper removable covering panel, to allow the access and maintenance of the components housed therein.

[0013] At such casing, the frame 2 has a housing 3, obtained on the front side thereon and apt to sealingly receive the seat, designated with 10, of the water closet V when the seat 10 itself is placed in a substantially vertical position. In the present embodiment, the seat housing 3 is substantially annular-ring shaped with substantially oval profile, so as to exactly reproduce the shape of the seat 10.

[0014] On the seat housing 3 a plurality of dispensing lights 41 is obtained, which, as it will be explained in greater detail hereinafter, in the present embodiment are substantially vaporization nozzles of a hygienizing fluid.

[0015] On the seat housing 3 a plurality of drying lights 42 is furthermore obtained, which, as it will be explained in greater detail hereinafter, acts substantially as outlet ports of a drying air flow.

[0016] The lights 41 and 42 are distributed on the whole surface of the housing 3 according to an annular-ring arrangement, with the dispensing lights 41 placed alternate to the drying lights 42.

[0017] In the present embodiment, it is provided that the apparatus 1 is provided in form of a kit comprising also the above-mentioned seat 10. The latter is apt to be revolvingly connected to the water closet V through rotatable connection means apt to exploit the same connection conventionally arranged on water closets V of known art. The seat 10 is furthermore revolvingly connected, or connectable upon installation, to the frame 2, according to modes which will be illustrated in greater detail hereinafter.

[0018] The seat 10 has a peripheral abutment edge 101, better visible in figure 3A, apt to cooperate with the periphery of the housing 3 to allow to sealingly receive the seat 10 itself in such housing 3.

[0019] By now referring to figures 3 and 3A, inside the frame 2 hygienizing means is housed, and in particular, dispensing means 51 of a hygienizing fluid which com-

prises the above-mentioned dispensing lights 41.

[0020] The dispensing means 51 further comprises, still in the present example: a tank 511 of hygienizing fluid, a distributing circuit 512, better visible in figure 3A, which connects the tank 511 with the dispensing lights 41; and pumping means 513 to feed the hygienizing fluid from the tank 511 to the lights 41 through the circuit 512.

[0021] In the present embodiment, the use of hygienizing liquid L is provided, and the above-mentioned pumping means 513 consists then in a simple electrically powered pump installed at the bottom of the tank 511.

[0022] The apparatus 1 then comprises drying means 52, apt to send an air flow on the seat 10 housed in the housing 3 through drying lights 42. In the present embodiment, such drying means 52 comprises, apart from lights 42, a fan, associated to a heat source apt to warm the air flow, and a distribution circuit, the latter visible in greater detail in figure 3A and designated with 522. Still in figure 3A also outlet lights 43 of the drying air flow are visible.

[0023] By now referring to figure 5, the apparatus 1 further comprises moving means 6 of the seat 10, associated to the latter at the above-mentioned rotatable connection between frame 2 and seat 10. Such rotatable connection is implemented, in the present example, by means of a pin 61 with horizontal axis integral with the seat 10, which pin 61, during the operation of the apparatus 1, is revolvingly received into a corresponding pin housing of the frame 2, the latter obtained below the seat housing 3. The pin 61 is then connected to an actuator of conventional kind, typically an electrical rotative motor, represented only schematically in figure 5 and apt to produce a rotation around its own axis of the pin 61 in the corresponding housing. In particular, the arrangement is so that the rotation of the pin 61, and then of the seat 10 fixed therewith, produces the rotation of the seat 10 itself from a substantially horizontal position, shown in figure 1, wherein it is rested on the water closet V, to a substantially vertical position, shown for example in figure 5, wherein it is received into the seat housing 3, and viceversa.

[0024] The dispensing means 51, the drying means 52 and the moving means 6 can provide an electrical power obtained directly through a connection with the main supply of the room housing the water closet, or obtained through a rechargeable accumulator housed in the frame 2.

[0025] In the present embodiment the apparatus 1 comprises also interface means 7 with the user, apt to allow the user himself/herself to selectively drive the moving means 6 of the seat 10 and the dispensing means 51 and the drying means 52.

[0026] In particular, such interface means 7 comprises a control panel having a first and a second button, 71 and 72 respectively, for controlling the moving means 6. The first button 71 is apt to produce the lifting of the seat 10 from the above-mentioned horizontal position to

the above-mentioned vertical position of insertion in the housing 3, whereas the second button 72 is apt to produce the inverse movement.

[0027] The control panel further provides a third button 73 controlling the dispensing and drying means 51 and 52.

[0028] Even if in figure 1 the control panel has been represented as assembled at a wall of the room housing the water closet, this can also be placed on a side wall of the casing of the frame 2. The panel will be further connected to the same electrically powered means associated to the dispensing means 51 and drying means 52.

[0029] At last, in the present embodiment, it is also provided that in the apparatus 1 means for feeding the discharge water to the water closet V be incorporated, housed inside the frame 2 and implemented in conventional way and connectable in conventional way to the water closet V and to the waterworks.

[0030] The application modes of the apparatus 1 will be now described.

[0031] First of all, as mentioned above, the apparatus 1 can be provided to an end user in form of a kit comprising the frame 2 and all the components housed therein and, separately from the latter, the seat 10 connectable to the frame 2, at the pin housing thereof, by means of pin 61. Such kit can also comprise the water closet V. In any case, as above said, the apparatus of the invention is suitable to be used in association to water closets of conventional kind.

[0032] In order to install the apparatus 1, it is sufficient to connect the frame 2 to the wall of the room housing the water closet V, behind thereto, through mechanical connection means of conventional kind.

[0033] In case of power from the general electrical main supply of the moving means 6, dispensing 51 and drying 52 means and of the interface means 7, the necessary electrical connections will be then implemented.

[0034] Furthermore, the tank 511 will be filled-up with hygienizing liquid, if not already so pre-arranged.

[0035] At last, in case the apparatus 1 incorporates also means for feeding the discharge water, a connection to the waterworks will be implemented, according to conventional methods.

[0036] At this point, the apparatus 1 is ready for use. A toilette user can then drive the moving means 6 through the first button 71, so that the seat 10 moves to the vertical position, resulting then sealingly housed inside the housing 3. At this point, the user drives the dispensing means 51 and the drying means 52 through the third button 73. In this way, the upper face of the seat 10, that is the one faced on the dispensing lights 41 and the drying lights 42, is hygienized by the liquid L and dried. The user drives then again the moving means 6 through the second button 72 in order to bring the seat 10, now ready for use, back to the horizontal position, that is rested on the water closet V.

[0037] At this point it will be better appreciated that

the apparatus of the invention allows an efficient hygienization of the water closet seat by means of a simple rotation motion of the seat itself, by exploiting the rotational degree of freedom thereof already usually provided in the water closets of known art. Therefore, the installation of the apparatus of the invention does not require any intervention on the real water closet, as the already existing means thereof for the connection to the seat can be utilized.

[0038] Furthermore, potentially the apparatus of the invention does not require any kind of adjustment not even of the seat of known art. In fact, the apparatus is suitable for a simplified embodiment wherein the moving means above introduced are not present, and it is the user himself/herself who, by simply lifting the seat, inserts it into the corresponding housing obtained in the frame.

[0039] Obviously, the fact of providing moving means provides the additional advantage of avoiding to the user to have indeed to manually lift the seat.

[0040] In any case, even when the moving means are present, the adjustment needs of the seat of known art are minimum, since it will have simply to be made fixed with a pin or with another equivalent member connected to the moving means themselves.

[0041] The apparatus, and in particular the frame thereof, is suitable to be implemented with an extremely reduced thickness, ranging for example between approx. 10 and 25 cm.

[0042] It will be then understood that the present invention is suitable for several embodiments and variants alternative to the ones sofar described, some of which are briefly illustrated by referring only to the aspects differentiating them from the embodiments sofar considered.

[0043] First of all, the apparatus can provide the use of any hygienizing agent alternative to the above-considered liquid.

[0044] Furthermore, the apparatus is suitable for a simplified embodiment providing a single dispensing light of the hygienizing agent, and, in case, a single drying light.

[0045] Furthermore, the apparatus can have a single light or a single plurality of lights which act both as dispensing lights, and, once the real hygienization is ended, as drying lights.

[0046] Moreover, the seal on the seat housing can be obtained in a way different from the cooperation between the seat edge and the periphery of the housing itself. For example, the frame can comprise a mobile seal member apt to cover, wholly or only at the periphery thereof, the seat, once the latter is placed into the seat housing.

[0047] Based upon an additional embodiment, the seat hygienization can occur automatically upon opening the toilette door, by means of a sensorization placed at said door and apt to drive the moving, dispensing and drying means in sequence.

[0048] At last, the apparatus of the invention is compatible also with the fact of providing a closing lid of the water closet, usually placed above the seat. In this case, moving means of such lid will be provided which separate it from the seat during hygienization of the latter.

[0049] The present invention has been sofar described by referring to preferred embodiments. It is to be meant that other embodiments underlying the same inventive concept can exist, all however comprised within the protective scope of the herebelow reported claims.

Claims

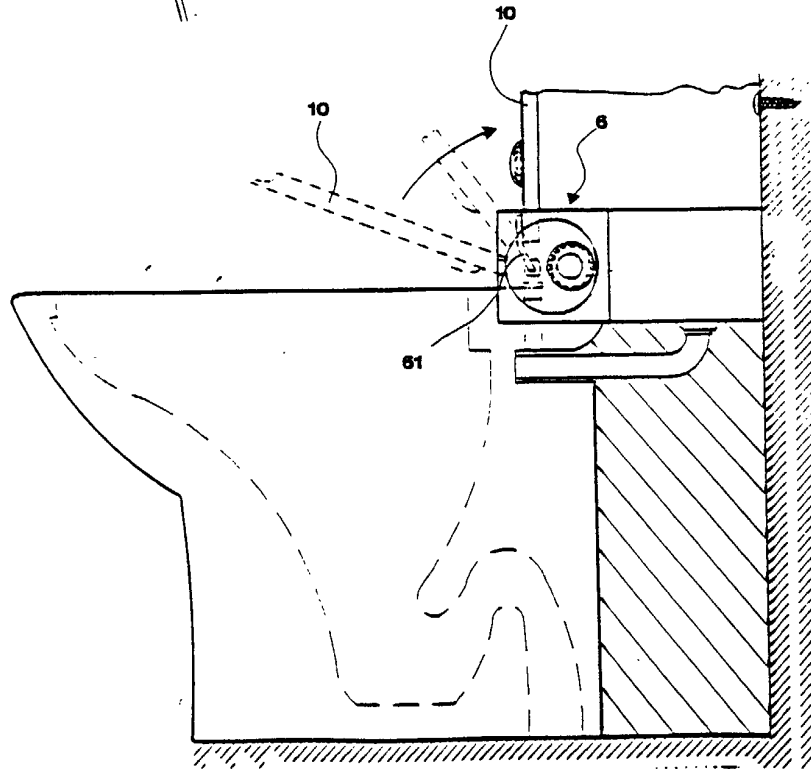
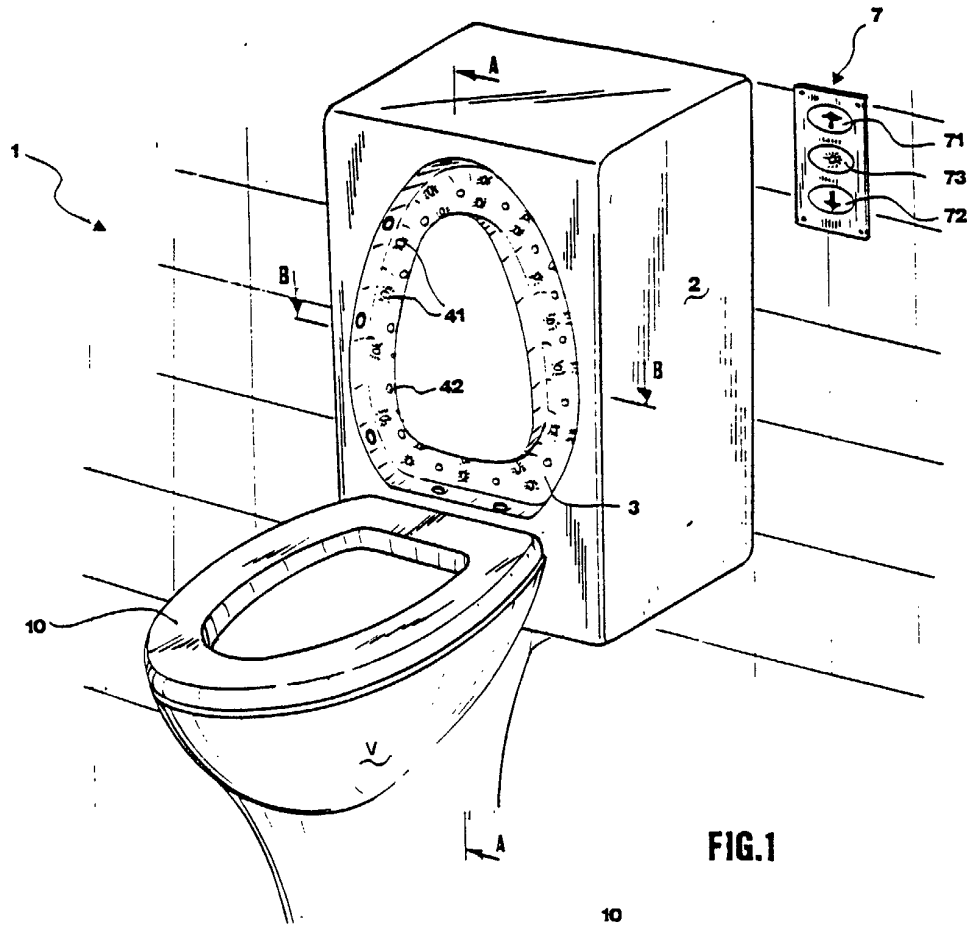
1. An apparatus (1) for hygienizing the seat of a water closet, comprising:
 - a frame (2), apt to be placed behind the water closet (V);
 - a seat housing (3), obtained on the front side on said frame and apt to sealingly receive the seat (10) of the water closet in substantially vertical position; and
 - dispensing means (51) of a hygienizing agent, housed inside said frame and comprising at least one dispensing light (41) of such agent (L) obtained on said seat housing.
2. The apparatus (1) according to claim 1, wherein said seat housing (3) has a substantially annular-ring shape apt to reproduce the shape of the seat itself (10).
3. The apparatus (1) according to claim 1 or 2, wherein said dispensing means (51) of a hygienizing agent comprises a tank (511) of such agent, a distribution circuit (512) which connects said tank with said at least one dispensing light (41) and pumping means (513) to feed the hygienizing agent from said tank to said light through said circuit.
4. The apparatus (1) according to any of the preceding claims, wherein said at least one dispensing light is a vaporization nozzle (41) of a hygienizing fluid (L).
5. The apparatus (1) according to any of the preceding claims, wherein said dispensing means (51) of a hygienizing agent comprises a plurality of dispensing lights (41) obtained on said seat housing (3).
6. The apparatus (1) according to the preceding claim, wherein the dispensing lights of said plurality (41) are distributed over the whole surface of said seat housing (3) according to an annular-ring arrangement.
7. The apparatus (1) according to any of the preceding

claims, comprising user interface means (73) apt to allow the user to drive said dispensing means (51) of a hygienizing agent.

8. The apparatus (1) according to any of the preceding claims, comprising drying means (52) of the seat (10) when received in said seat housing (3). 5
9. The apparatus (1) according to the preceding claim, wherein said drying means (52) comprises at least one drying light (42) obtained on said seat housing (3) and apt to act as an outlet port of a drying air flow. 10
10. The apparatus (1) according to the preceding claim, wherein said drying means (52) comprises a plurality of drying lights (42) obtained on said seat housing (3). 15
11. The apparatus (1) according to the preceding claim, wherein the drying lights of said plurality (42) are distributed over the whole surface of said seat housing (3) according to an annular-ring arrangement. 20
12. The apparatus (1) according to claim 10 or 11 when dependent from claim 5 or 6, wherein said drying lights (42) are placed alternate to said dispensing lights (41). 25
13. The apparatus (1) according to any of the claims 8 to 12, comprising user interface means (73) apt to allow the user to drive said drying means (51). 30
14. The apparatus (1) according to any of the preceding claims, comprising rotatable connection means (61) of the seat (10) of the water closet (V) to said frame (2). 35
15. The apparatus (1) according to the preceding claim, comprising moving means (6) of the seat (10) of the water closet (V), placed at said rotatable connection means (61) between frame (2) and seat and apt to produce the rotation of the latter from a substantially horizontal position, wherein it rests on the water closet, to a substantially vertical position, wherein it is received within said seat housing (3). 40 45
16. The apparatus (1) according to the preceding claim, comprising user interface means (71, 72) apt to allow the user to drive said moving means (6) of the seat (10). 50
17. The apparatus (1) according to any of the preceding claims, comprising means for feeding discharge water to the water closet (V), housed inside said frame (2) and connectable to the waterworks. 55
18. Seat (10) for water closet (V) apt to be used in association with an apparatus (1) according to any of

the preceding claims, which seat has a peripheral abutment edge (101) apt to cooperate with the periphery of said seat housing (3) to allow the sealingly receiving of the seat itself in said housing.

19. Sanitary kit, comprising a hygienizing apparatus (1) according to any of the claims 1 to 17 and a seat according to claim 18.
20. The sanitary kit according to the preceding claim, further comprising a water closet (V) connectable to said seat (10).



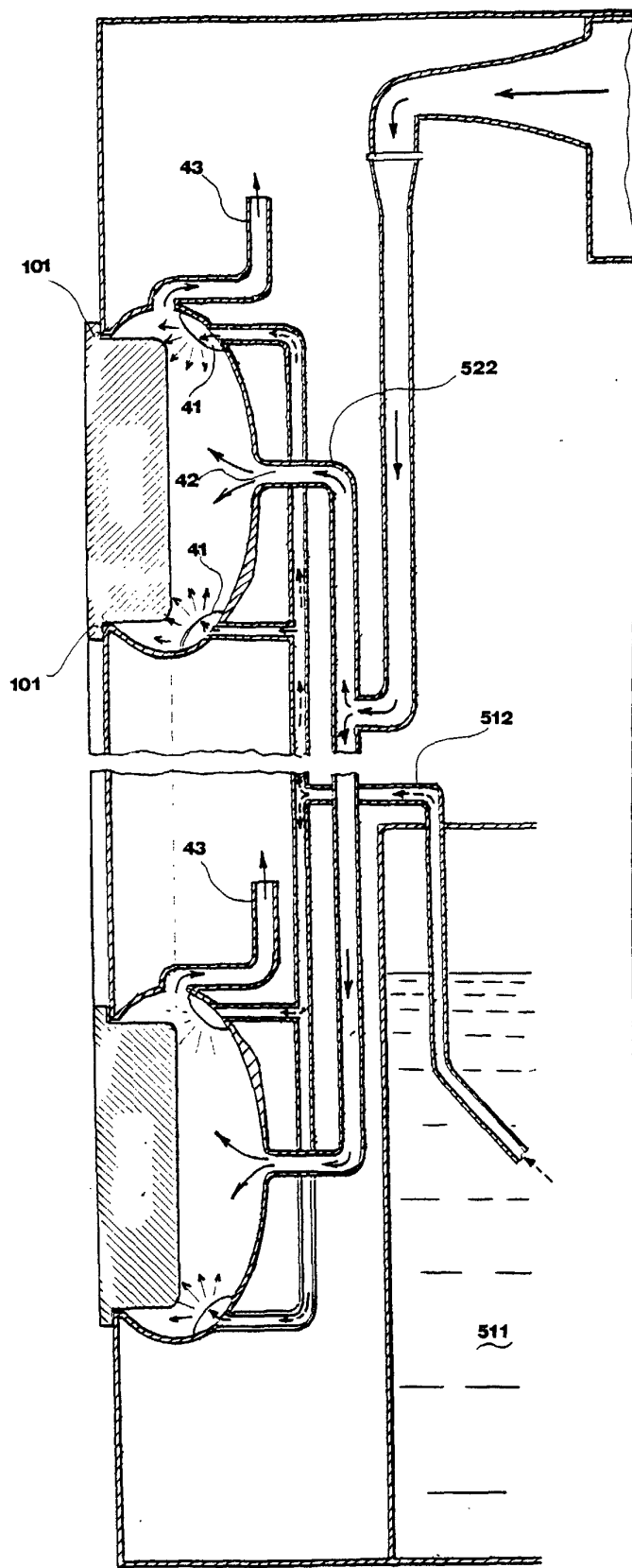


FIG. 3A

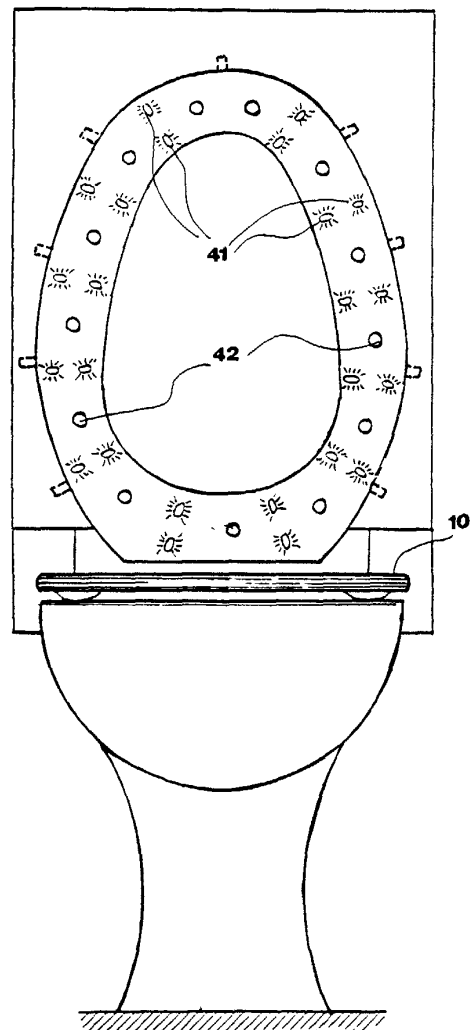
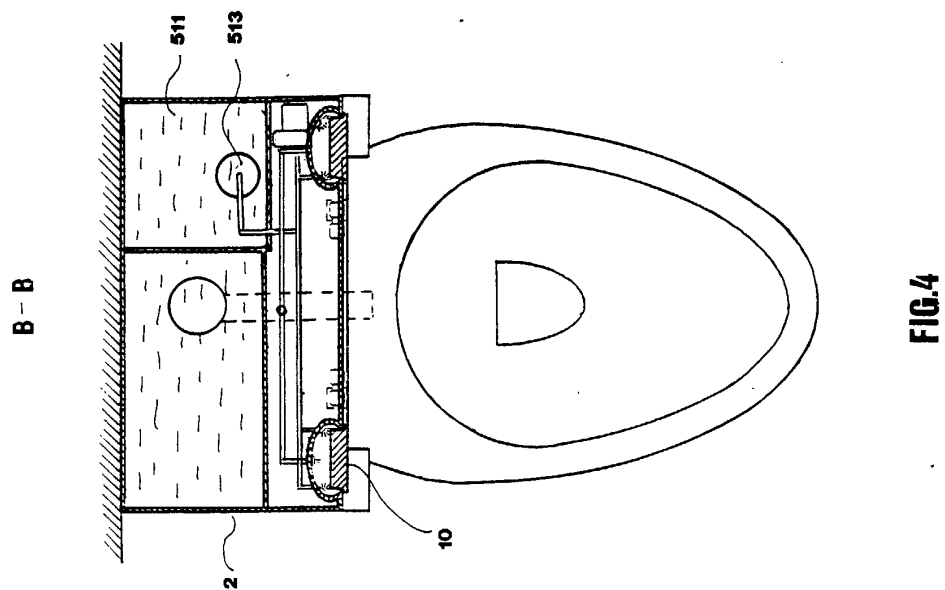
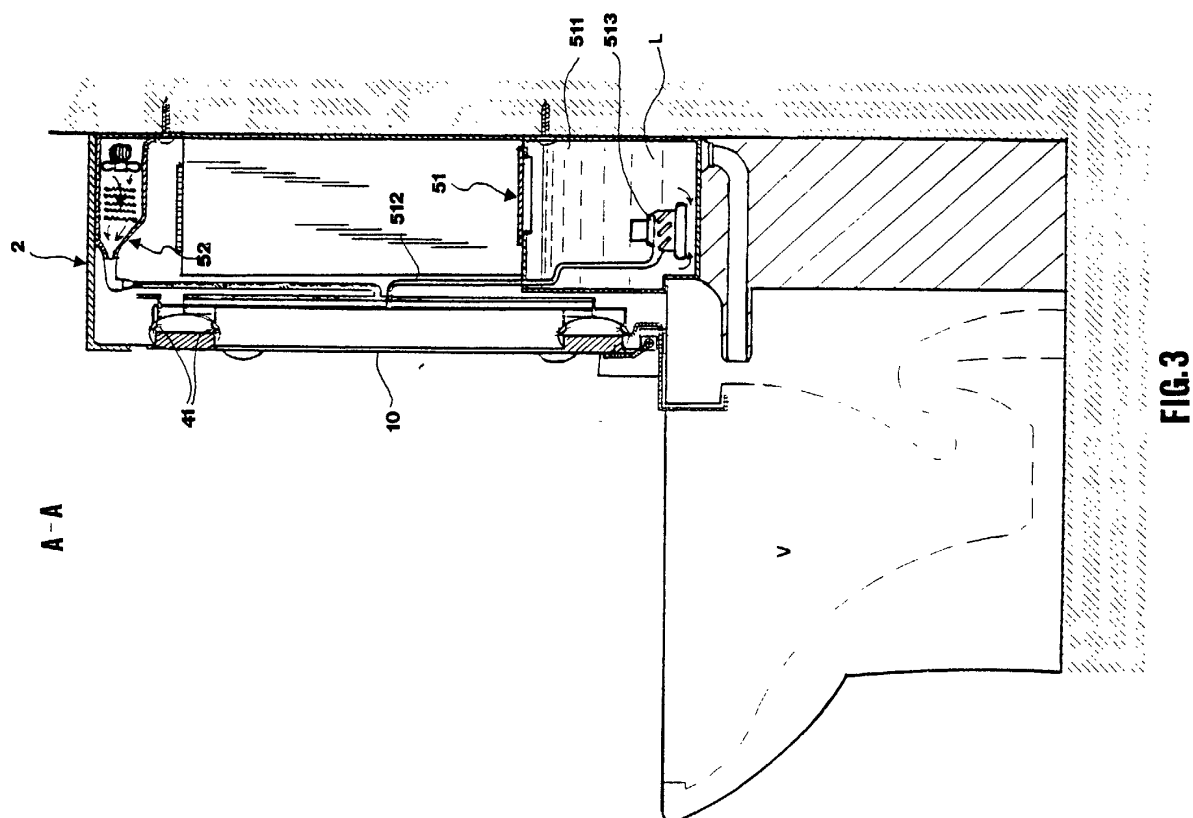


FIG. 2





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 02 42 5352

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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A	WO 90 04347 A (AUTOMATED IDENTIFIC SYST INC) 3 May 1990 (1990-05-03) * page 3, line 25 - page 6, line 32; figures 4,5 *	1,18-20	TECHNICAL FIELDS SEARCHED (Int.Cl.7) A47K E03D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 22 October 2002	Examiner Zuurveld, G
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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**ANNEX TO THE EUROPEAN SEARCH REPORT
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