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(12) # EUROPEAN PATENT SPECIFICATION

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(54) **Sterilizer for a toilet spray attachment.**

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Description

The present invention relates to a sterilizer for a toilet spray attachment. Umann's U.S. Patent No. 2,875,450 disclosed a device for automatically applying water for cleansing purpose and for applying forced draft of warm air to the cleansed parts of the user's body, which however did not provide means to apply sterilizing agent or cleaning chemical on the user's body for enhanced hygienic purposes.

A sterilizer filled with sterilizing agents or cleaning chemicals which will be conveniently directed into the spray nozzle adapted for spraying and cleansing a user's anus or genitals for hygienic purposes is known from US—A—4441219 which may be incorporated with a mixing mesh as disclosed in FR—A—1096194, which shows a sterilizer for toilet spray attachment comprising:

a liquid reservoir filled with a sterilizing agent for a cleaning chemical therein, and having a top cover drilled with a venting hole therein;

a delivery tube connected to the liquid reservoir having a valve formed on the tube;

a water conduit communicated with a water reservoir supplied with pressurized water by a boosting pump, the conduit provided with a water valve thereon;

a spray nozzle for spraying a user's anus or genitals fluidically communicated with the water conduit and the delivery tube and

a mixing portion of spray cone portion formed in the spray nozzle adjacent to an outermost end portion of the delivery tube for mixing water sprayed from the water conduit and sterilizing agent drained from the delivery tube.

It is the object of the present invention to provide a sterilizer having no less advantages than that of the sterilizer exemplified by US—A—4441219 incorporated with a mixing device of FR—A—1096194 and in addition to provide a sterilizer having an improved spray nozzle. The present invention is characterized in that the spray nozzle includes a water passage communicated with the water conduit and having an outermost end portion of the water passage formed with a water injection hole inclinedly projecting upwardly, a chemical liquid passage communicated with the delivery tube having an outermost end portion of the chemical liquid passage formed with a chemical injection opening which is positioned above the water injection hole, a partition plate separating the water passage and the chemical liquid passage, and the mixing portion formed as a spray cone portion divergently formed on an outermost end portion of the partition plate for mixing water sprayed from the water injection hole and chemical liquid drained from the chemical injection opening.

The present invention will be further described with reference to the accompanying drawings, in which:—

Figure 1 is an illustration of the present invention.

Figure 2 is a sectional drawing of the present invention.

Figure 3 shows a modification based on a system as shown in Figure 1 of the present invention.

Figure 4 is a sectional drawing of the present invention as viewed from I—I direction of Figure 3.

Figure 5 is a side-view drawing of the present invention as viewed from Figure 4.

Figure 6 shows a rear spray nozzle of the present invention as shown in Figure 3.

Figure 7 shows a front spray nozzle of the present invention as shown in Figure 3.

Figure 8 shows another preferred embodiment of a valve of the present invention.

As shown in Figures 1 and 2, the present invention comprises a toilet bowl (1), a toilet seat (2), a warm water reservoir (3), a pair of water valves (41, 42) fixed on two branch conduits (51, 61) communicated with the water reservoir (3), a rear spray nozzle (5), a front spray nozzle (6) and a pair of sterilizers (7).

Each sterilizer (7) includes a liquid reservoir (71) having a top cover (72) drilled with a venting hole (73) in the cover (72), a delivery tube (74) connected with the reservoir (71), a mixing portion (75) perpendicularly connected with the lower portion of the tube (74), a sealer (77) resiliently held by a spring link (76) which is secured towards the mixing portion (75) to normally seal a lower port (78) of delivery tube (74) and operatively opened by a downcoming water from pressurized water source and a mixing mesh (79) inserted in the mixing portion (75). The reservoir (71) may be filled with sterilizing agents or cleaning chemicals A for enhanced hygienic cleaning purposes for the toilet users.

The mixing portion (75) of the sterilizer (7) is vertically connected between the rear spray nozzle (5) having an injection port (52) and the water conduit (51), and positioned beyond the perpendicular connection of the lower portion of the delivery tube (74). Another mixing portion (75) of another sterilizer (7) is horizontally connected with the front spray nozzle (6) having an injection portion (62) and the water conduit (61), and positioned beyond the perpendicular connection of the lower portion of the other delivery tube (74). The installation of the mixing portion (75) on the spray nozzle (5) or (6) is not limited and can be optionally chosen, such as in a horizontal, vertical or tilted postion depending upon the applying situations. The warm water reservoir (3) is supplied with pressurized water through a pipe (31) by a boosting pump (32) which boosts the pressure of the incoming water from a water source (not shown) directed from inlet pipe (33).

When using the present invention, the water valves (41), (42) are opened to allow pressurized water flowing through the two

branch conduits (51), (61) towards the downstream mixing portions (75) to open the sealers (77), whereby the liquid in tube (74) gravitationally flowing from each reservoir (71) will be drained into the mixing portion (75) and thoroughly mixed with the downcoming water within the mixing mesh (79) and finally sprayed through nozzles (5), (6) for cleaning the user's anus and genitals respectively.

The boosting pump (32) of the present invention can be suitably chosen to develop a sufficient water pressure for a better mixing of water with the chemical liquid.

If the toilet of the present invention is installed on a floor having an enough inlet water head, for example, as installed in a high building, the boosting pump (32) will then be omitted.

As shown in Figures 3—7, a modification based on a system as shown in Figures 1, 2 may be made in accordance with the present invention, in which each sterilizer (7) includes a liquid reservoir (71) having a top cover (72) drilled with a venting hole (73) in the cover (72), a delivery tube (74) connected with the reservoir (71) and having its lower port (78) connected with either conduit (51) or (61), and a valve (8) which may be automatically closed and provided in the delivery tube (74) between an upstream tube portion (741) and a downstream tube portion (742) of the tube (74) directing toward either nozzle (5) or (6). Between the reservoir (71) and the valve (8), there is provided a second valve (740) which may be manually operated in each delivery tube (74).

The valve (8) includes a cylinder body (81) having a flange (814) mounted on a socket (211) formed inside an upper seat cover (21) of the toilet seat (2), a resilient plug (82) reciprocatively held within the cylinder body (81), a stem portion (83) extending downwards from the plug (82), a restoring spring (84) inserted in the cylinder body (81) and resiliently retaining the plug (82), a spring plate (85) having its inner end secured to a bracket (212) in the seat (2) and having its outer end contacting the stem portion (83), and an actuating rod (86) extending upwards from an outer end of cushion (23) and normally biasing the cushion (23) downwards to ride on bowl (1) as resiliently acted by the spring plate (85) to suspend the seat (2) without raising the stem portion (83) to thereby normally close the plug (82).

A cushion (23) for providing an actuating rod (86) thereon may be suitably selected from a plurality of cushions (23) fixed under the lower plate (22) of the toilet seat (2). By modifying one of the two elastic nails (24) mounting the cushion (23) on the plate (22) through holes (25) to be an actuating rod (86) as above-mentioned, the cushion (23) as shown in Figure 2 is pivoted about an inner elastic nail (24) serving as "fulcrum" to stably ride on bowl (1), when the outer rod (86) is biased downwards by the spring plate (85).

The cylinder body (81) includes: an upper cylindrical hole (811) for inserting the spring (84) therein, an inverse truncated-cone hole (812) adjacent to the hole (811) engageable with the plug (82) shaped as inverse truncated cone, a lower cylindrical hole (813) formed under the truncated-cone hole (812) and having a diameter smaller than that of the upper hole (811), a liquid inlet hole (815) fluidically communicated with the upstream tube portion (741) and a liquid outlet hole (816) fluidically communicated with the downstream tube portion (742). Both holes (815), (816) are fluidically communicated with the inverse truncated-cone hole (812) and capable of being sealed by the plug (82) shaped as inverse truncated cone.

One delivery tube (74) has its lower port (78) connected with the rear spray nozzle (5) as shown in Figure 6 in which the rear nozzle (5) includes a water passage (53) having an upper portion of the passage (53) communicated with the water conduit (51) and having an outermost end portion of the passage (53) formed with a water injection hole (531) inclinedly projecting upwardly, a chemical liquid passage (55) communicated with the delivery tube (74) and having an outermost end portion of the passage (55) formed with a chemical injection opening (551) positioned above the water injection hole (531), a partition plate (54) separating the two passages (53), (55) and a spray cone portion (56) divergently formed on a lower or outermost end portion (541) of the partition plate (54) for mixing the water and the chemical liquid.

The other delivery tube (74) has its lower portion (78) connected with the front spray nozzle (6) as shown in Figure 7 in which the front nozzle (6) includes a water passage (63) having its outermost end portion formed with a water injection hole (631) inclinedly projecting upwardly, a chemical liquid passage 65 communicated with the other delivery tube (74) and having an outermost end portion of the passage (65) formed with a chemical injection opening (651) positioned above the water injection hole (631), a partition plate (64) separating the two passages (63), (65) and a spray cone portion (66) divergently formed on an outermost end portion (641) of the partition plate (64).

When using the present invention, the depression by the user's gravity on the toilet seat (2) will bias the cushion (23) and its actuating rod (86) upwards to raise the stem portion (83) of the plug (82) to open the liquid holes (815), (816) to flow chemical liquid from reservoir (71) towards either nozzle (5) or (6) and whereby upon the opening of valve (41) or (42), the water will be sprayed through either nozzles (5) or (6) to mix the chemical liquid in the cone portion (56) or (66) for hygienic flushing purpose. However, when the user leaves the toilet seat, the spring plate (85) will bias the cushion (23) downwards to recover the plug (82) which is also restored by the spring (84) to close the liquid holes (815), (816) to stop liquid drainage.

If the user wants to adjust the liquid quantity or to stop the liquid supply, he or she may close the valve (740) of the chemical tube (74).

As shown in Figures 6 and 7, each water

injection hole (531) or (631) is located under each liquid opening (551) or (651) and each spray cone portion (56) or (66) is made as an enlarged shape so that the liquid drained from the delivery tube (74) will be immediately laded in the water stream as sprayed through either hole (531) or (631) without causing any backflow of water into liquid passage.

Another preferred embodiment of the present invention is shown in Figure 8, in which the aforementioned cylinder body (81) is formed with a cylindrical hole (811) for inserting the spring (84) and the plug (82). The plug (82) includes a packing plunger (82a) normally sealing the liquid holes (815), (816), a rod portion (82b) secured to the plunger (82a) and having a diameter smaller than that of the plunger (82a), a packing ring (82c) sealing the lower portion of the hole (811) and a stem (83) protruding downwards to contact the spring plate (85). The plug (82) is limited by the cylinder bottom (810). Upon the depression of toilet seat (2), the stem (83) will be raised to move the packing plunger (82a) upwards to open the holes (815), (816) whereby the liquid from upstream tube (741) will flow through the aperture between the rod portion (82b) and the cylindrical hole (811) towards the downstream tube (742) for end use.

Claim

A sterilizer for a toilet spray attachment comprising a liquid reservoir (71) filled with sterilizing agents or cleaning chemicals and having a top cover (72) in which is drilled a venting hole (73), a delivery tube (74) connected to said liquid reservoir (71), a mixing portion (75) in which is inserted a mixing mesh (79) and which is connected perpendicularly to the lower portion of said delivery tube (74), said mixing portion (75) being connected between a water conduit (51 or 61), controlled by a valve (41 or 42), and a spray nozzle (5 or 6) arranged for spraying a user's anus or genitals, said mixing portion positioned beyond the perpendicular connection of the lower portion of the delivery tube, a warm water reservoir (3) supplied with pressurized water by a boosting pump (32) provided on a water inlet pipe, a sealer (77) normally sealing a lower port (78) of said delivery tube, said sealer (77) resiliently held by a spring link (76) which is secured towards said mixing portion (75) to normally seal said lower port of said delivery tube and operatively opened by a downcoming pressurized water from a water source, whereby upon the opening of said valve (41 or 42) of said water conduit (51 or 61), the pressurized water flowing towards said mixing portion (75) will open said sealer (77) to drain the liquid from said liquid reservoir (71) so that the water and the liquid will be mixed in said mixing portion to be finally sprayed through said spray nozzle (5 or 6) for cleansing a user's anus or genitals, characterized in that said spray nozzle (5 or 6) includes a water passage (53 or 63) communicated with said water conduit (51 or 61) and having an outermost end portion of said water passage (53 or 63) formed with a water injection hole (531 or 631) inclinedly projecting upwardly, a chemical liquid passage (55 or 65) communicated with said delivery tube (74) having an outermost end portion of said chemical liquid passage (55 or 65) formed with a chemical injection opening (551 or 651) which is positioned above said water injection hole (531 or 631), a partition plate (54 or 64) separating said water passsge (53 or 63) and said chemical liquid passage (55 or 65), and a spray cone portion (56 or 66) divergently formed on an outermost end portion (541 or 641) of said partition plate (54 or 64) for mixing water sprayed from said water injection hole (531 or 631) and chemical liquid drained from said chemical injection opening (551 or 651).

Patentanspruch

Sterilisator für eine Toiletten-Sprüh-Ansatzeinrichtung mit einem Flüssigkeitsreservoir (71), das mit Sterilisationsagentien oder Reinigungschemikalien gefüllt ist und einen oberen Deckel (72) hat, in den ein Lüftungsloch (73) gebohrt ist, mit einem Auslaßrohr (74), das mit dem Flüssigkeitsbehälter (71) verbunden ist, mit einem Mischteil (75), in das ein Mischnetz (79) eingebaut ist und das senkrecht mit dem unteren Teil des Auslaßrohres (74) verbunden ist, wobei das Mischteil (75) zwischen einer durch ein Ventil (41 oder 42) gesteuerten Wasserzuführung (51 oder 61) und einer Sprühdüse (5 oder 6) zum Besprühen der Genitalien oder des Anus eines Benutzers verbunden ist, und wobei das Mischteil unterhalb der senkrechten Verbindung des unteren Teils des Auslaßrohrs angeordnet ist, mit einem Warmwasserreservoir (3), das durch eine an einem Wasseranschlußrohr angeschlossenen Förderpumpe (32) mit Druckwasser versorgt ist, mit einer Dichtung (77), die normalerweise einen unteren Auslaß (78) des Auslaßrohres abdichtet, wobei diese Dichtung (77) federnd durch eine Federverbindung (76) gehalten ist, die die Dichtung (77) an dem Mischteil (75) hält, um normalerweise den unteren Auslaß des Auslaßrohres abzudichten, und die durch Wirkung herabfließenden Druckwassers von einer Wasserquelle geöffnet wird, wodurch bei Öffnung des Ventils (41 oder 42) der Wasserleitung (51 oder 61) das in Richtung des Mischteils (75) fließende Druckwasser die Dichtung (77) öffnet, um die Flüssigkeit aus dem Flüssigkeitsreservoir (71) zu leiten, sodaß das Wasser und die Flüssigkeit in dem Mischteil gemischt werden, um schließlich zur Reinigung des Anus oder der Genitalien eines Benutzers durch die Sprühdüse (5 oder 6) gesprüht zu werden, dadurch gekennzeichnet, daß die Sprühdüse (5 oder 6) einen Wasserdurchlaß (53 oder 63) enthält, der mit der Wasserleitung (51 oder 61) kommuniziert, daß ein äußerstes Endteil des Wasserdurchlasses (53 oder 63) mit einem ansteigenden nach oben weisenden Wassereinspritzloch (531 oder 631) geformt ist, daß ein Durchlaß (55 oder 65) für chemische Flüssig-

keit mit dem Auslaßrohr (74) kommuniziert, das ein äußerstes Endteil des Durchlasses (55 oder 65) für die chemische Flüssigkeit hat und mit einer Chemikalieneinspritzöffnung (551 oder 651) geformt ist, die oberhalb des Wassereinspritzlochs (531 oder 631) angeordnet ist, daß eine Trennplatte (54 oder 64) den Wasserdurchlaß (53 oder 63) und den Durchlaß (55 oder 65) für die chemische Flüssigkeit trennt, und daß ein auseinanderstrebend konisches Sprühteil (56 oder 66) auf einem äußersten Endteil (541 oder 641) der Trennplatte (54 oder 64) geformt ist, um aus dem Wassereinspritzloch (531 oder 631) gesprühtes Wasser und aus der Chemikalieneinspritzöffnung (551 oder 651) geleitete chemische Flüssigkeit zu mischen.

Revendication

Stérilisateur pour un pulvérisateur de W.C. comprenant un réservoir de liquide (71) rempli d'agents bactéricides ou de produits chimiques nettoyants et comportant un couvercle (72) dans lequel est percé un trou d'aération (73), un tube de distribution (74) relié audit réservoir de liquide (71), une portion de mélange (75) dans lequelle est inséré un crible de mélange (79) et qui est reliée perpendiculairement à la portion inférieure dudit tube de distribution (74), ladite portion de mélange (75) étant raccordée entre une conduite d'eau (51 ou 61) commandée par une vanne (41 ou 42), et un gicleur (5 ou 6) agencé de sorte à asperger les parties génitales ou anales d'un utilisateur, ladite portion de mélange étant positionnée au-delà de la connexion perpendiculaire de la portion inférieure du tube de distribution, un réservoir d'eau chaude (3) étant alimenté en eau sous pression par une pompe de surpression (32) prévue sur un tuyau d'entrée d'eau, un obturateur (77) fermant normalement un orifice inférieur (78) dudit tube de distribution, ledit obturateur (77) étant maintenu de manière élastique par une attache à ressort (76) qui est fixée vers ladite portion de mélange (75) pour fermer normalement ledit orifice inférieur dudit tube de distribution et étant ouvert de manière opérante par une eau sous pression descendante à partir d'une source d'eau, afin qu'à l'ouverture de ladite vanne (41 ou 42) de ladite conduite d'eau (51 ou 61), l'eau sous pression s'écoulant vers ladite portion de mélange (75) ouvre ledit obturateur (77) pour faire s'écouler le liquide dudit réservoir de liquide (71) de sorte que l'eau et le liquide soient mélangés dans ladite portion de mélange pour être finalement pulvérisés par ledit gicleur (5 ou 6) pour nettoyer les parties génitales ou anales d'un utilisateur, caractérisé en ce que ledit gicleur (5 ou 6) comprend un passage d'eau (53 ou 63) communiquant avec ladite conduite d'eau (51 ou 61) et comportant une portion d'extrémité la plus à l'extérieur dudit passage d'eau (53 ou 63) formée avec un trou d'injection d'eau (531 ou 631) se projetant incliné ver le haut, un passage de liquide chimique (55 ou 65) communiquant avec ledit tube de distribution (74) comportant une portion d'extrémité la plus à l'extérieur dudit passage de liquide (55 ou 65) formée avec une ouverture d'injection de produit chimique (551 ou 651) qui est située au dessus dudit trou d'injection d'eau (531 ou 631), une plaque de séparation (54 ou 64) séparant ledit passage d'eau (53 ou 63) et ledit passage de liquide chimique (55 ou 65), et une portion conique de pulvérisation (56 ou 66) formée de manière divergente sur une portion d'extrémité la plus à l'extérieur (541 ou 641) de ladite plaque de séparation (54 ou 64) pour mélanger l'eau pulvérisée à partir dudit trou d'injection d'eau (531 ou 631) et le liquide chimique s'écoulant de ladite ouverture d'injection de produit chimique (551 ou 651).

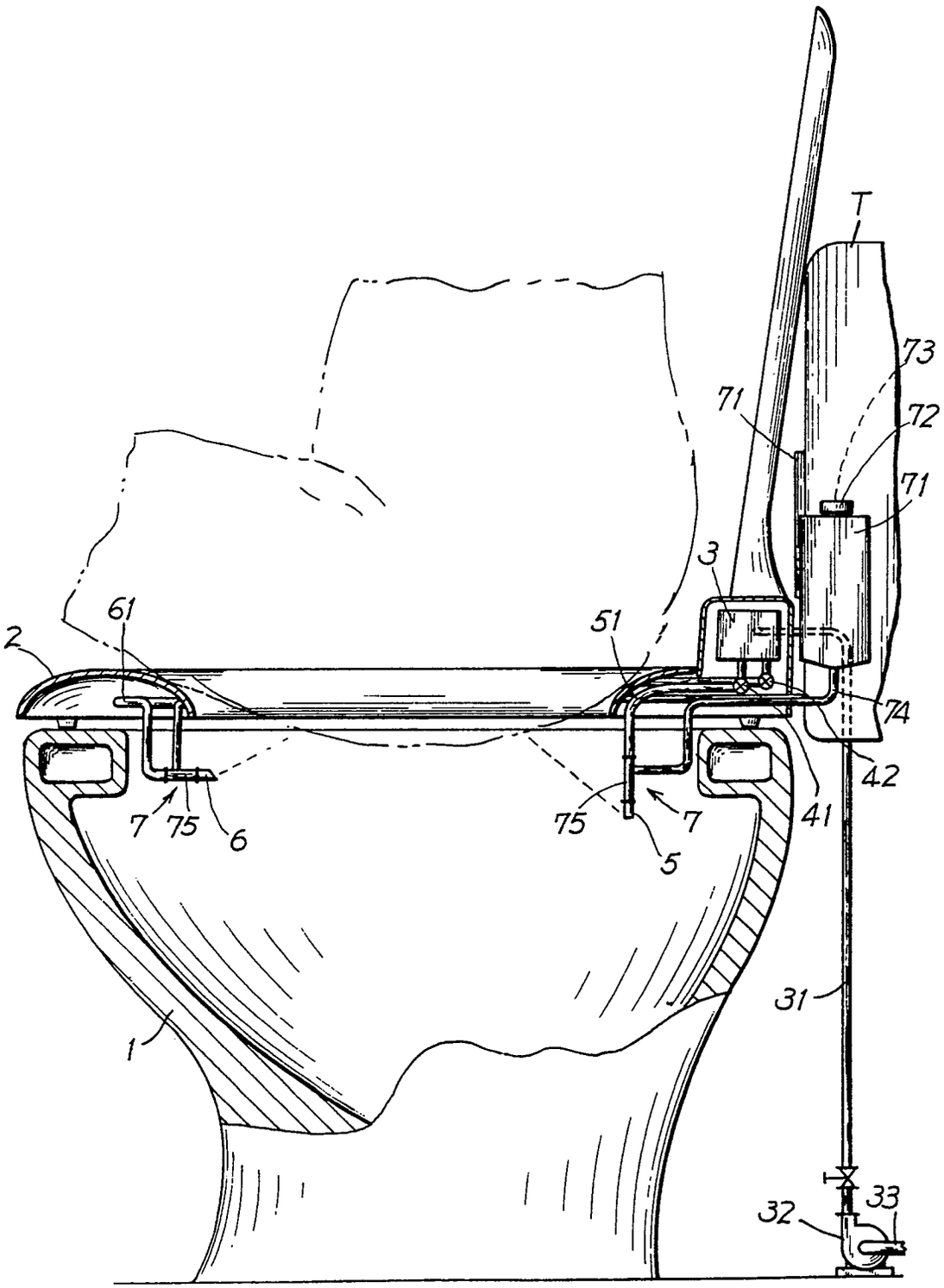


FIG.1

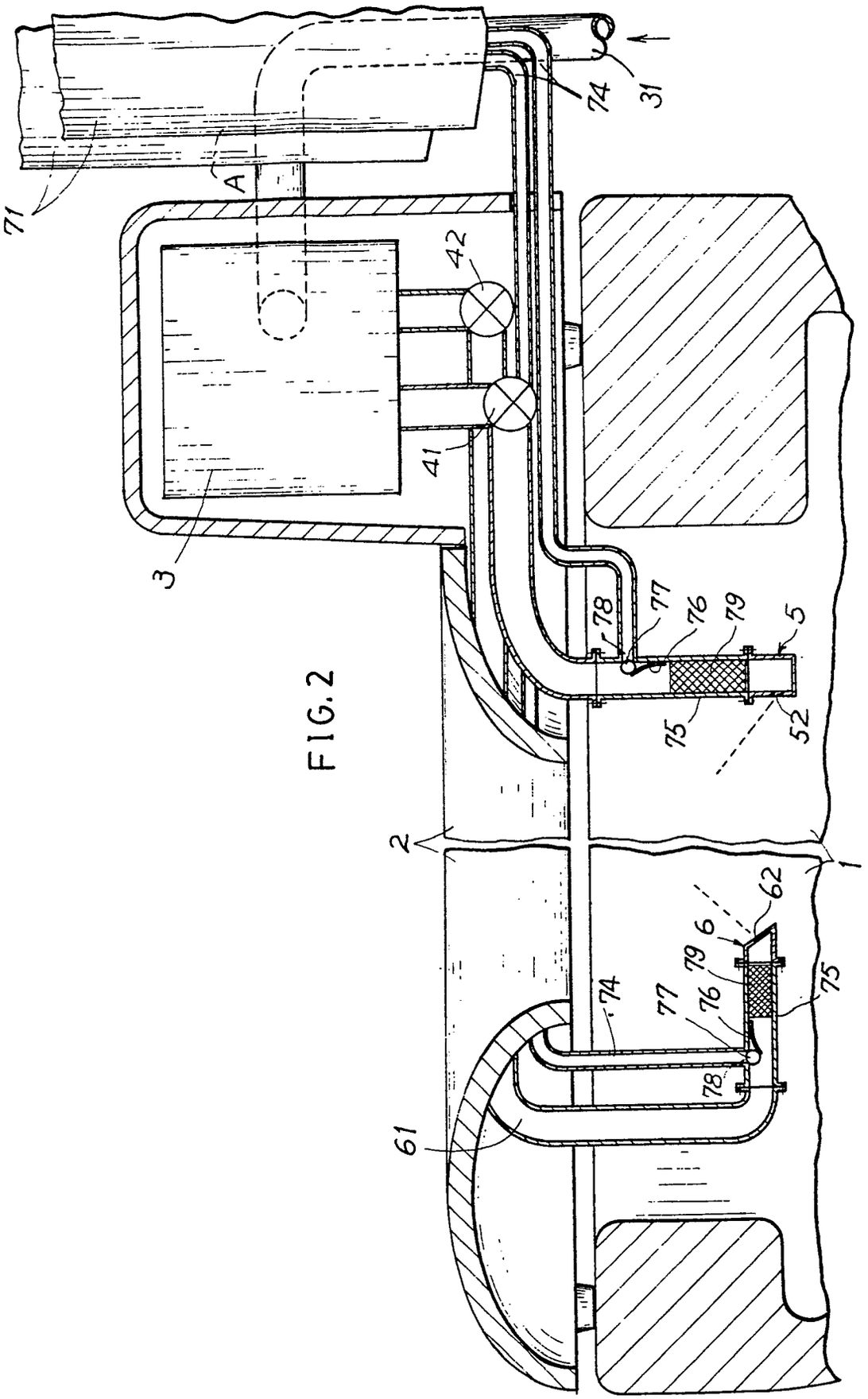
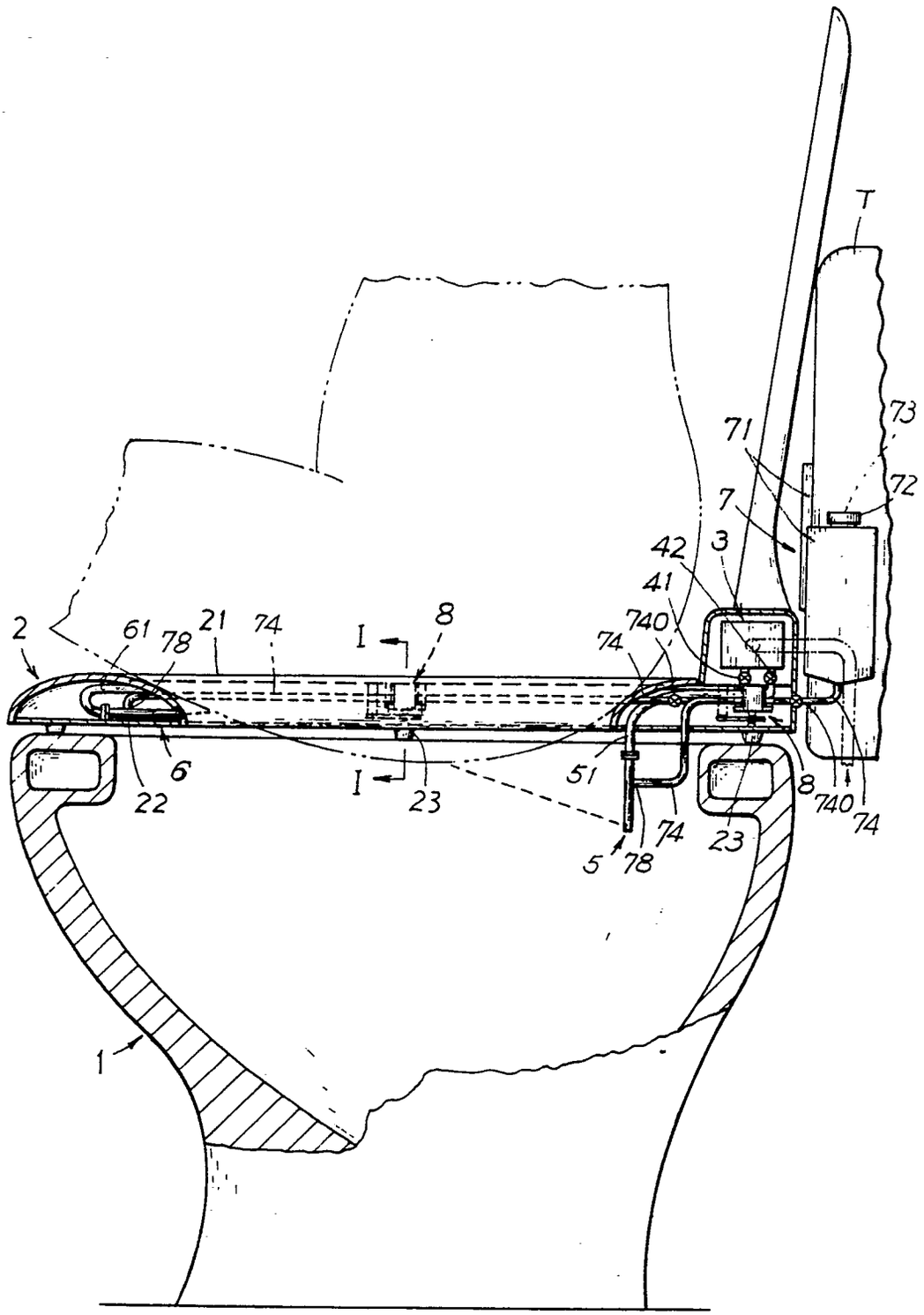


FIG. 2


T
73
71
72
7
42
3
41
740
74
2
61
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6
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51
74
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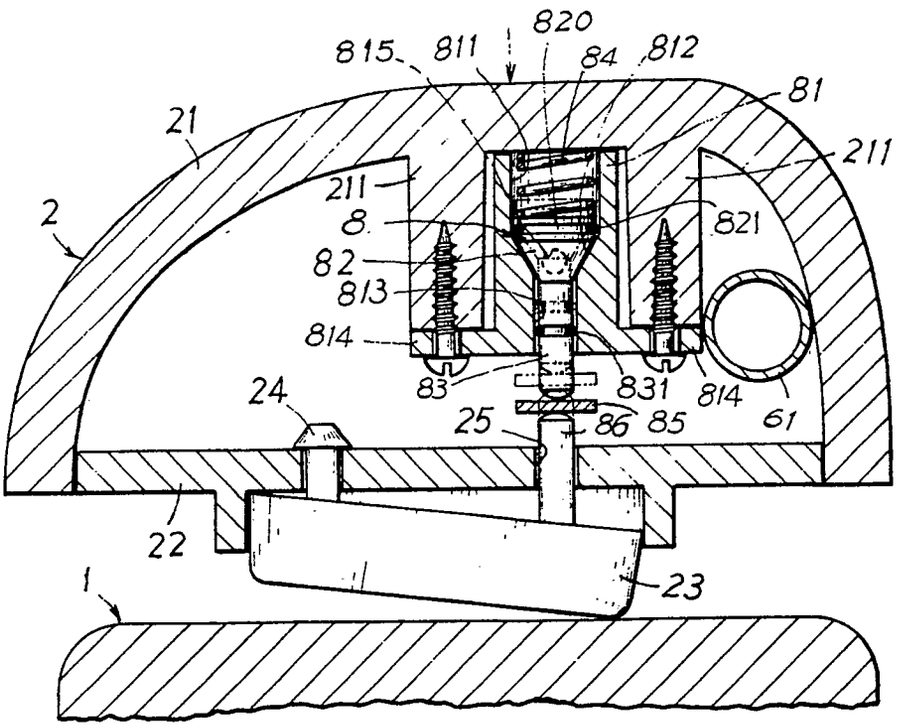
78
74
23
8
740
74
1

FIG. 3


820
815
811
84
812
81
21
211
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813
814
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831
814
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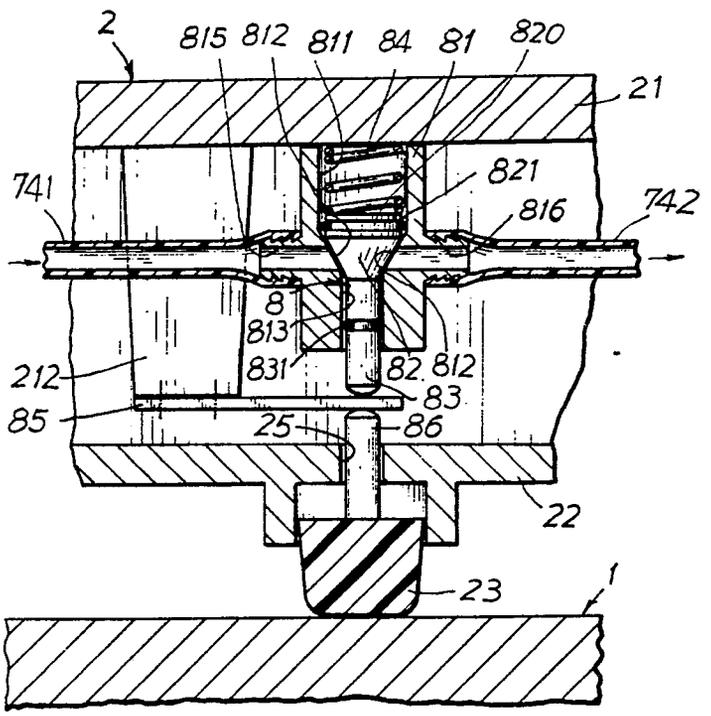
24
25
86
85
22
23
1

FIG. 4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23
1

FIG. 5

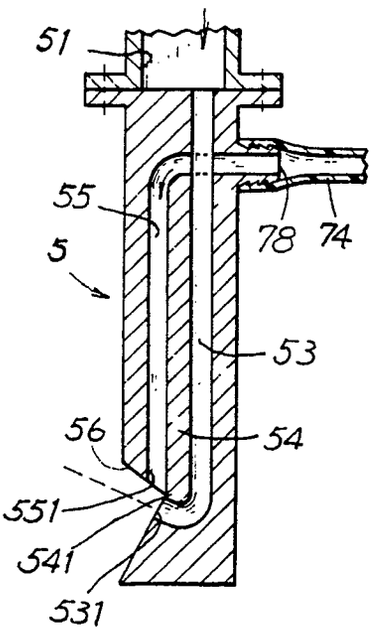

FIG.6

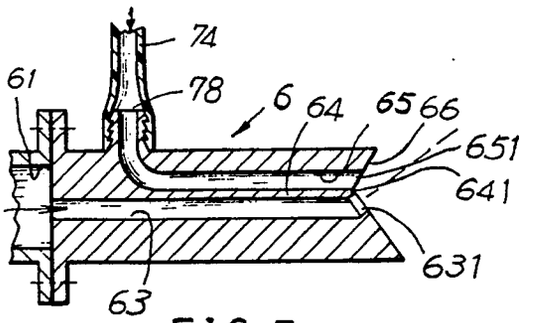

FIG.7

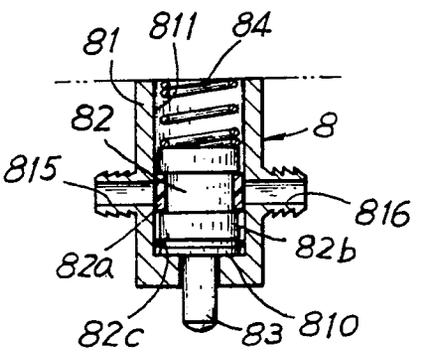

FIG.8