ANTI-BACKSPLASH TOILETS AND URINALS

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ABSTRACT
A toilet and urinal anti-backsplash configuration and apparatus are provided which preferably include a back wall with a tube built into said back wall so that major portions of urine being deposited into tube are prevented from backsplash toward urine depositor or adjacent surfaces. Said tube is preferably incorporated into the same material, most commonly white porcelain, as the rest of the toilet or urinal, thereby blending in with the fixture housing, and is rinsed via the same flushing system already in place with conventional toilets and urinals.
ANTI-BACKSPLASH TOILETS AND URINALS

FIELD OF THE INVENTION

This invention is related to the lavatory industry and, more particularly, to anti-backsplash systems and associated methods within the lavatory industry.

BACKGROUND OF INVENTION

Over the years, a multitude of devices, attachments, and housing configurations have been developed to reduce backsplash from urine when a person uses both toilets and urinals. This invention primarily pertains to male users, when in a standing position, and urinating into a toilet or urinal. The impact of urine upon fixture walls or water reservoirs within a toilet or urinal creates a backsplash of urine onto surrounding surfaces, including the person using the toilet or urinal.

Prior devices, attachments, or configurations of toilet and urinal housing fail to surround the urine stream itself in such a way so as to remove the ability for back-splash, when urine is streamed onto proposed additions. There have been a wide array of elongated urinal housing shapes offering vertical curves, backsplash shields, etc., most of which are both visually unusual and/or substantially more costly to manufacture since they require major deviations from common toilet and urinal housing shapes already in the market.

SUMMARY OF INVENTION

The proposed urine tube is a relatively simple enhancement that easily incorporates into existing toilet and urinal walls, by being built into the back wall of typically porcelain structures. This enhancement would work equally as well for toilets or urinals made of other materials such as plastic, stainless steel, fiberglass, etc., as found in RVs, Trailers, Boats, Planes, etc. The simplicity of the modification eliminates the need to redesign the general shape and appearance of either residential or commercial units which have longstanding consumer acceptance. This tube enhancement offers the same ‘target’ appeal of the well known and publicized ‘fly’ etched into the porcelain of toilets and urinals. The etched fly has received credible results by inherently directing urine streams into the most optimal curvature location to reduce backsplash. Yet the etched fly’s true benefit is neither known or understood by users in general, which is that in addition to improving aim, the fly is supposedly, strategically placed in the optimal location to reduce backsplash. Nor are etched fly placements consistent, with some manufacturers locating the fly etching in the middle rear wall, some lower, some lower left, etc., thereby confusing users as to whether or not there is a true benefit for aiming at the novel little fly at all.

However, the proposed tube opening is a target with a purpose, and will not be viewed as a whimsical, novel addition. Acceptance will be instant, immediate, remembered, and desired. Users will quickly realize they are not experiencing the typical backsplash, nor will they hear near the amount of noise often produced while urinating, as the urine stream gets muffled, contained, & directed toward the drain or into the water. Likewise, the female gender will appreciate the substantial reduction in odor, & clean up, associated with the standard amount of backsplash on surrounding surfaces. Maintenance crews will have less clean up, while the general public will also appreciate the odor reduction from decreased germs coming from urine on said floors and surfaces. The female gender perspective is not a sexist comment, since the fact is that backsplash and spatter on floors and surrounding surfaces is simply not caused by women sitting on toilets, and certainly not urinals, (though there have been some comical, unsuccessful attempts to create urinals for females). Because of that, females have a particularly high disgust quotient when seeing, let alone having to use, restrooms and toilets with an obviously high amount of surrounding spatter, & repulsive, if not gross, odor therein.

For toilets, particularly in residential applications, this tube could be entirely obscured from view, by the toilet seat, becoming immediately obvious when the seat is raised. Here again, users will be rewarded by both raising the seat, which should always be done, but often isn’t, and hitting the target, thereby greatly reducing the amount of noise and backsplash in the process. For commercial applications it may be better to position the upper tube opening so that it is plainly visible with the rim lowered, making the target appeal immediately apparent, and thereby used, gaining the benefits of reduced backsplash.

The opening of the lower end of the toilet tube has a couple variations, which could be either vertical or horizontal slit, through horizontal is the preferred alignment, or an optional cup with holes, to prevent feces or debris from going back up into the tube when flushing. This is not a filter, and there are no other filters or replaceable parts within this tube embodiment, as is the case with so many other anti-backsplash attachments and devices. More on this lower end tube configuration in the description of drawings section.

Because of the greatly reduced amount of backsplash, the general housing shape or urinals in particular could conceivably be scaled back substantially, which has been necessary to essentially capture the amount of backsplash and spatter typical of urinal designs to date. The closest example of how to convey this thought would be to cite the urinals attached to walls in portable toilets. Those plastic urinals are far smaller than conventional porcelain urinals, but could be adequate if the user were to accurately aim into the tube. In fact, urinals in portable toilets have a drain tube leading to the main tank. In some styles of such portable toilet urinals the drain tube is at the bottom center of the urinal, and if one urinates directly into that tube it illustrates the complete elimination of related backsplash by hitting the “target”. This is not to suggest the size of the portable toilet urinal would be recommended for conventional wall use, but rather to illustrate there may be a size in between that would make practical sense, while appreciably cutting back on the amount of material, and thereby cost, necessary to make a satisfactory urinal housing.

Backsplash is a problem generic to every type of toilet that is designed to accept male urination from a standing position, which is practically every type of toilet in existence, save the bidet. Therefore, a urinal tube would, and should, be a very beneficial addition to every type of newly styled toilet or urinal presently going into production.

Because of the simplicity of incorporating this urine tube design into already accepted standards & shapes, the cost of designing this addition should not be a prohibitive consideration from a manufacturing standpoint. Therefore, the cost of toilets with this new improvement would not have to be substantially more than the cost of toilets already on the market. Of course this is up to the manufacturer given their realistic expectation to yield higher prices when they have
exclusive rights to toilets or urinals equipped with a sought after new improvement, regardless of the costs associated with such improvement. Nevertheless, if the cost increase for such improvement is not significant, then the number of consumers who would purchase this new model, & replace the existing toilets in their homes could be a sizeable portion of sales from the onset. Given the proper marketing campaign, the desirability for the elimination of the odors, germs, and overall distaste associated with the effects of backsplash should make this a very attractive feature from the initial market introduction.

[0011] Given the number of commercial venues that have embraced the etched fly idea, and replaced existing toilets for what would be thought a marginal benefit in comparison, this new ‘target with a purpose’ applied to both toilets and urinals, should be considered far more motivating than the ‘fly’, which still would have to be deemed a commercial success in it’s own right. However, while the ‘fly’ was, & is, a novel idea, it does not translate well to the residential market, where this backsplash reduction feature would have equally widespread appeal.

[0012] The invention thus conceived is susceptible to numerous modification and variations, all of which are within the scope of the inventive concept. All the details may furthermore be replaced with other technically equivalent ones. In practice, the materials used, as well as the shapes and dimensions, may be any according to the requirements without abandoning the scope of the claims presented.

BRIEF DESCRIPTION OF DRAWINGS

[0013] Some of the features, advantages, and benefits of the present invention have been stated, others will become apparent as the description proceeds, of a preferred but not exclusive embodiment of an enhancement to reduce urinary backsplash from toilets and urinals, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

[0014] FIG. 1 is a schematic perspective of a toilet showing the upper opening for the proposed urine tube within the back wall of a toilet basin;
[0015] FIG. 2 is a schematic perspective of a urinal showing the upper opening for the proposed urine tube within the back wall of a urinal;
[0016] FIG. 3 is a schematic cutout perspective of a toilet showing the urine tube located in the back wall of the basin with a horizontal slit at the lower end of the urine tube. FIG. 4 is a schematic axonometric view of the lower exit end of the urine tube exiting into the basin trap channel, depicting the preferred horizontal slit option.
[0017] FIG. 5 is a schematic and partially cutout perspective of a urinal showing the tube located in the back wall of the basin with lower tube end exiting above drain level.
[0018] FIG. 6 is a schematic and partially cutout perspective of a urinal showing the tube located in the back wall of the basin with lower tube end exiting below drain level.
[0019] FIG. 7 is a schematic cutout perspective of a toilet showing the tube located in the back wall of the basin with the lower exit having a cap with holes to allow urine to pass through.
[0020] FIG. 8 is a side perspective of one possible cap type fitting into the lower end of the urine tube exiting into the trap channel, which helps prevent debris from flowing back into the tube when flushing.

[0022] FIG. 9 is a bottom perspective of one possible cap style to fit into the lower end of the tube where it exits into the trap channel, showing holes to allow urine to flow through into the drainage channel.
[0023] FIG. 10 is a schematic and partially cutout perspective of a urinal showing the tube located in the back wall of the basin with the upper and lower ends of the tube, exiting near the drain location.
[0024] FIG. 11 is a top down view of the preferred basin configuration, showing a slope to the front & back of the basin, which provides better position of upper tube opening. This shows how the opening could be obscured by a lowering toilet seat.
[0025] FIG. 12 is a top down view of a basin configuration whereby the back wall is moe vertical, making it more difficult to access the upper opening.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0026] This invention is applicable to both toilets and urinals, therefore the description will be twofold as the discussion progresses through both applications. In order to distinguish labeling, T for toilet, and U for Urinal, will precede numeric designations.

[0027] This invention comprises a urine tube T6/U7, having an upper opening T1/U4 for urinating into, and a lower opening T2/U5 for the urine to pass through, en route to the conventional drainage channel T10, or drain U11. The upper opening T6/U7 could have many variations in shape, protruding from, or inset into, the basin wall T8/U9, or a combination of both, whereby the back portion of the opening T6/U7 inset into the back wall T8/U9, while the front portion protrudes from same wall. The preferred embodiment would be to keep the front portion of the opening T1/U4 on the same plane as the basin wall T8/U9 for the sake of adequate rinsing when flushing, but is not limited in design.

[0028] The length of the urine tube itself T6/U7 is variable, dependent on the style of the toilet or urinal. For conventional water filled toilets the upper opening T1 will be above the water level when the basin is in it’s normal full position, prior to flushing. Positioning of the opening T1 is variable, and is not critical as long as it is above the water level. In order to provide optimal results the opening T1 should be approximately a couple inches above the water level, in order to allow for urine to be fully captured within the tube T6 walls, which will minimize both backsplash, and the noise created by urine splashing into water directly.

[0029] For toilet applications the shape of the basin wall T8, does have some effect as to the ease of accessing the upper opening T1. Some styles of toilets have a more vertical back wall and sloped front wall, which shifts standing water in the basin toward the back of the basin, while others have a sloped back wall and front wall, shifting standing water toward the middle, or front of the basin. For this invention, toilets with a sloped back wall is preferred, which would provide easier access to the T1 opening, or ‘target’. The amount of vertical or horizontal pitch angle is not a limitation, but recognizable variable for optimizing use and results.

[0030] For urinals the same variations already discussed in shape of the upper opening T6, apply to the urinal opening U7. Some urinals styles have water in the basin, while others do not. The length of the tube U7 itself is not critical, but the preferred embodiment would be to have the lower end of the
urine tube U5 exit close to the urinal drain U11, regardless of whether or not the urinal style has water in the basin or not. [0031] The diameter of the tube T6/U7 is not critical, however, it would be expected to be, but not limited to, approximately 1/8" to 3/4" in diameter. Many different shapes & configurations of the upper tube opening T1/U4, could vary the size of the actual target opening T1/U4, but the minimum opening is expected to be approximately, but not limited to, the same range of 1/8" to 3/4" of an inch. It is worth noting that the etched fly previously discussed is 1/8" or less, but that target size does not carry the same significance since the proposed opening T1/U4 needs to be streamed into for achieving the best results, whereas the fly focuses the user toward an area in general. 

[0032] The lower end of the Toilet urine tube hole T2/T3 needs to be configured and located so as to prevent feces from freely entering the tube opening T2/T3 when flushing. There are a number of ways to accomplish this objective by those knowledgeable in the industry, one of which would be to the use of a horizontal slit T14 depicted in FIG. 4, at a width & height adequate to allow urine to freely pass through, but not so wide as to be a probable route for feces to enter when flushing. A horizontal slit would provide the minimum amount of time for feces to pass by when rushing by said slit upon flushing, as opposed to a vertical or diagonal slit, or a round hole, all of which would be more susceptible to feces being caught in such an opening during flushing. Additional configurations could be possible, whereby the higher side of the tube is indented into the trap channel wall, which would make feces have to enter the tube in a backwash, or reverse direction of the flushing flow, which is unlikely.

[0033] Nevertheless, both the tube opening T1/U4, diameter T6/U7, and lower opening T2/U5 should all be of a size sufficient to allow cleaning with an appropriately sized bristle brush designed for this purpose, as need be. Such brushes are already on the market for many purposes, aquarium filter tube brushes being an obvious example of the necessary type.

[0034] Another possibility for this lower opening is T3 shown in FIG. 6. In this case the T3 opening could be rounded, oval, etc, and capped with an appropriate material, plastic, stainless steel, etc, which fits into the opening of T3, and could be of a shape shown in FIG. 7 and FIG. 8 showing the T15 & T16 perspectives. This is not the preferred solution to this need since it permits the manufacture of an additional fitting, that could need to be cleaned periodically, nevertheless, the possibility bears recognition herein. The shape of opening or cap used for this alternative option is not critical, as long as the cap fits into the manufactured shape selected.

[0035] With respect to the positioning of T1/FIG. 1, the T1 opening could be completely obscured from view when the toilet seat T12 is in the lowered position. This could be desirable particularly for residential applications. In this case accessing the ability to stream into T1 would require raising the seat T12, which is beneficial if one wants to reduce the amount of noise typically associated with urinating in a toilet, as well as the backsplash problems already addressed.

[0036] From a commercial toilet application it may prove beneficial to have the T1 opening obvious when the seat is lowered simply because it’s best to have the urine tube used as much as possible whether or not the seat is raised, though indeed the seat should always be raised.

[0037] A worthwhile upgrade to the T6/U6 tubes could be to have a dedicated rinsing tube routed to flow directly into the tube, possibly positioned just past visibility from the standing position, to improve adequate rinsing, but tied into the existing flushing system, typically coming down just below the lip of the upper basin wall.

[0038] The proposed embodiment of U6/T7 is a tube, with upper and lower openings. Backsplash reduction of a similar nature could also be accomplished if proposed tube was not entirely closed within the toilet or urinal basin walls. In this format there could be a vertical opening visible from upper to lower end of proposed channel. This derivation has been considered and included as one possible means of achieving a similar backsplash reduction, however, the closed tube enhancement is the preferred embodiment, as this is deemed to have more visual appeal, for being less obvious than a full length channel.

[0039] This urine tube enhancement would also be a unique improvement for waterless types of toilets and urinals currently coming into acceptance, particularly in third world countries, where backsplash from urine streams against any solid surface poses the same spatter, and therefore germ & odor problems already discussed.

[0040] Though the urine opening T1/U4 for these applications would likely have, but not limited to, a closable flap or slide, rather than a tube, that modification would not pose a problem for one knowledgeable in the industry. Therefore, this present recognizes the uniqueness of this improvement, and prohibitively translates across the board, to preclude manufacturers of the less common toilets & urinals in RV’s, Trailers, Boats, Planes, Trains, etc., from incorporating this separate urine opening feature, regardless if such opening leads to a tube, or utilizes a flap, slide or other such adaptation being built into their niche designs without proper authorization, as these derivations must be considered obvious to those knowledgeable within the industry.

PRIOR ART


[0042] This is a small sampling of anti-backsplash related devices within the lavatory industry. Extensive field research has yet to identify a similarly proposed alteration of existing toilet and urinal design.

That which is claimed is:

1) A toilet & urinal anti-backslash configuration comprising a toilet or urinal, including a fixture back wall with a tube built into the back wall of toilet or urinal, with said tube which leads to, and exits beneath the surface of the water of toilet, and in some styles of urinals with water reservoirs at their base, or near to the drain of urinals without base reservoirs.

2) Upper opening of tube of sufficient size & shape to enable urine stream to be aimed into opening which routes urine down & away so that major portions of urine being steam into tube are prevented from splashing back toward person, or onto nearby floors and surfaces.
3) Tube positioned in back wall to allow for rinsing when flushed, flowing to the same drain as is presently in use with conventional water system toilets and urinals.

4) Tube greatly reduces amount of backsplash, and/or spatter, of urine, either onto the person, toilet, floor, or surrounding area, by channeling it down into the water or toward the drain of a toilet, or urinal.

5) Tube also eliminates, or greatly reduces, amount of noise typically associated with urinating into a water filled basin of a conventional toilet, which is of particular benefit in residential use when other people are in immediate vicinity outside of restroom.

6) Reduced backsplash also reduces amount of odor, germs, & corrosive effects of urine, on external toilet surface, hardware fittings, or immediate area floors, walls, cabinetry, or partitions.