

DESCRIPTION

URINAL DRAIN TRAP

5 **Technical Field**

[0001] The present invention relates to a urinal drain trap.

Background Art

[0002] Figure 12 of Patent Document 1 discloses a conventional
urinal drain trap. The urinal drain trap is formed into a
10 cartridge type and includes a lid, a body and a partition wall.
The urinal drain trap is fitted into a circular opening defined
in a lower end of a bowl surface of the urinal thereby to be mounted
to the urinal. The lid has a circular shape as viewed in a planar
view. The lid has a central part formed with an inlet through
15 which urine flowing downwards along the bowl surface further
flows into the trap. The body includes a cylindrical sidewall
extending downward from an outer peripheral edge of the lid, a
bottom continuous from a lower end of the sidewall, and an outlet
over which collected urine flows. The partition wall extends
20 downward from a part of the underside located on the inward side
relative to the outer peripheral edge of the lid and is formed
so as to define a space together with the bottom therebetween.
A folded portion extends in a crosswise direction from a lower
end of the partition wall toward the inlet side. The folded
25 portion is formed into an inclined surface ascending toward a
distal end thereof.

[0003] The body has an interior that is divided by the partition
wall and the folded portion into a first region located below

the inlet and above the folded portion, a second region where the outlet is provided, and a third region located below the folded portion and above the bottom. The outlet is open above the lower end of the partition wall. The first and second regions

5 communicate with each other via the third region. The first region is filled with a sealing liquid which is water-insoluble and has a smaller specific gravity than urine, whereby a sealing layer is formed so as to be located above the collected urine.

[0004] Furthermore, Figure 1 of Patent Document 1 discloses

10 another conventional urinal drain trap. This urinal drain trap is also formed into a cartridge type and includes a lid, a body and a partition wall. The urinal drain trap is fitted into an opening defined in a lower end of a urinal bowl surface of the urinal thereby to be mounted to the urinal. The lid has a

15 circular shape as viewed in a planar view. The body includes a cylindrical sidewall, a bottom continuous from a lower end of the sidewall, and an outlet over which collected urine flows.

An inlet through which urine having flowed downward along the bowl surface is formed between a circumferential edge of the lid

20 and the sidewall of the body. A partition wall extends downward from a part of the underside located on the inward side relative to the outer peripheral edge of the lid and is formed so as to define a space together with the bottom therebetween. The partition wall has a lower end which is open and is formed into

25 a cylindrical shape.

[0005] The body has an interior that is divided by the partition wall into a first region located outside the partition wall and a second region located inside the partition wall. The first

and second regions communicate with each other via a third region located below the lower end of the partition wall and above the bottom. The first region is filled with a sealing liquid which is water-insoluble and has a smaller specific gravity than urine, whereby a sealing layer is formed so as to be located above the collected urine.

[0006] The inlet is provided at a location where urine flows from above therethrough into the first region. The outlet is formed in an upper end of a cylindrical outlet conduit which rises from the bottom of the body in the second region and is disposed to be concentric with the partition wall.

[0007] In the foregoing conventional urine drain traps, the sealing layer can prevent foul odors of urine collected in the body from being given out through the inlet. Furthermore, back-flow of odor from a drainage path communicating with a downstream side can be blocked by the urine collected in the body. Consequently, a urinal having the urinal drain trap does not produce odor from the inlet into the toilet booth without use of flush water, whereupon the urinal can favorably be used.

20 Prior Art Document

Patent Documents

[0008] Patent Document 1: Japanese Patent No. 3515785

Summary of the Invention

Problem to Be Overcome By the Invention

25 [0009] However, urine swiftly flows from the first region into the third region in the case of the urinal drain trap disclosed in Figure 12 of Patent Document 1 since the first region has a short flow path. Consequently, the sealing liquid tends to be

conveyed into the third region with the urine flowing into the third region. Furthermore, since the folded portion is the inclined surface gently descending toward a downstream side in the third region, the flow path has less vertical changes such that the sealing liquid conveyed into the third region tends to be conveyed further into the downstream second region, tapping into the flow of urine. The sealing liquid conveyed into the second region has a smaller specific gravity than urine, the buoyancy causes the sealing liquid to ascend in the second region. Thus, the sealing liquid conveyed into the second region cannot be returned into the first region, thereby flowing outward through the outlet. Consequently, long-term use of the urinal drain trap results in gradual flow of the sealing liquid out of the outlet, reducing an amount of the sealing liquid and thinning the sealing layer. When the sealing layer is thinned, there is a possibility that foul odors of collected urine may be produced out of the inlet.

[0010] Furthermore, in the urinal drain trap disclosed in Figure 1 of Patent Document 1, the outlet conduit is disposed to be concentric with the partition wall, and an ascending flow path of the urine in the second region is formed so as to provide a predetermined distance between an outer surface of the outlet conduit and an inner surface of the partition wall. Since urine remains in this space, gel urinary calculi tend to adhere to the surface in this space. When the space between the outer surface of the outlet conduit and the inner surface of the partition wall is narrow, the gel urinary calculi adherent to the outer surface of the outlet conduit and the inner surface of the partition wall

accumulate, there is a possibility that the ascending flow path may early be clogged.

[0011] The present invention was made in view of the above-described prior circumstances and has as a problem to be solved an object to provide a urinal drain trap which can prevent
5 foul odors from being produced for a long period and can desirably drain urine for a long period.

Means for Overcoming the Problem

[0012] A urinal drain trap according to the present invention
10 includes a lid fitted in an opening defined in a lower end of a urinal bowl surface and having an inlet through which urine flowing along the urinal bowl surface further flows; a body having a sidewall which is formed so as to extend downward from a peripheral edge of the lid, a bottom which is formed to be
15 continuous to a lower end of the sidewall, and an outlet over which collected urine flows; and a hollow partition wall provided inward of an outer circumferential edge of the lid and having a lower end that is open with a distance between the bottom of the body and said lower end, wherein the body has an interior
20 which is divided by the partition wall into a first region defined outside the partition wall and a second region defined inside the partition wall, the first and second regions communicating with each other via a third region defined below the lower end of the partition wall and above the bottom; and a sealing liquid
25 that is water-insoluble and has a smaller specific gravity than urine is poured into either the first or the second region thereby to be formed into a sealing layer over remaining urine, the urinal drain trap being characterized in that the lower end of the

partition wall has a peripheral edge that is formed with a connecting portion extending in a lateral direction toward one of the first and second regions, the connecting portion having a distal end peripheral edge formed with a folded portion
5 extending upward; and the inlet is defined between the partition wall and the folded portion so that urine flows thereinto from above, and the outlet is open above an upper end of the folded portion within the other of said first and second regions.

10 [0013] In the above-described urinal drain trap, the urine having entered into the inlet passes through the sealing layer, flowing between the partition wall and the folded portion from above. Since the lower ends of the partition wall and the folded portion are connected to each other by the connecting portion,
15 the urine is changed from downward flow to upward flow in a region (hereinafter, "convection region") surrounded by the partition wall, the connecting portion and the folded portion, whereupon a convective flow of urine occurs. As the result of urinary inflow, the sealing layer is agitated such that much of the
20 sealing liquid drawn below the sealing layer is engulfed in the convective flow. Consequently, the sealing liquid remains in a convection region. When the convective flow ceases with stop of urinary inflow, the sealing liquid remaining in the convection region upwardly moves by buoyancy thereof, joining the sealing
25 layer.

[0014] Furthermore, when flowing over an upper end of the folded portion from the convection region and further flowing along the downward flow path toward the third region, urine has a lower

momentum than when flowing into the convection region. Accordingly, when flowing over the upper end of the folded portion from the convection region while joining the flow of urine, the sealing liquid is conveyed to the middle location of the downward
5 flow path, remaining there. Thus, the sealing liquid has less possibility of being conveyed to the third region. When urine ceases to flow, the sealing liquid remaining in the downward flow path is surfaced by its buoyancy, joining the upper sealing layer.
[0015] Thus, the sealing liquid has less possibility of being
10 conveyed to the third region by the urinary flow. This can suppress outflow of the sealing liquid through the outlet provided downstream relative to the third region. Consequently, a reduction in the sealing liquid can be suppressed even in the use for a long period of time, and the sealing layer is less
15 subject to thinning.

[0016] Accordingly, the urinal drain trap according to the invention can prevent foul odors from being produced for a long period of time.

[0017] The inlet may be defined so as to extend along the
20 partition wall. In this case, urine inflowing through the inlet is dispersed such that the momentum of urine flowing into the body is dampened. This suppresses agitation of the sealing layer due to urinal inflow, whereupon the sealing liquid has less possibility of being drawn below the sealing layer.
25 Consequently, outflow of the sealing liquid through the outlet can further be suppressed. Furthermore, agitation of the sealing layer is suppressed since the urine inflowing through the inlet further flows downward along the surface of the

partition wall. This can also suppress outflow of the sealing liquid. Consequently, the sealing layer is less subject to thinning, and foul odors can be prevented from being produced.

[0018] A predetermined space may be defined between the folded portion and the partition wall. In this case, convective flow can be caused in the entire convective region since the predetermined space is defined between the folded portion and the partition wall. This can reduce an amount of sealing liquid flowing over the upper end of the folded portion from the convective region while joining the flow of urine, resulting in suppression of outflow of the sealing liquid. Furthermore, even when adhering to an inner surface of the convective region, the gel urinary calculus has less possibility of non-uniformly accumulating in the convective region. Accordingly, outflow of the sealing liquid which could result from accumulation of gel urinary calculi at a specific portion can be suppressed, whereupon no convective flow is caused in the portion. Consequently, the sealing layer is less subject to thinning such that foul odors can be prevented from being produced.

[0019] The folded portion may extend by a length that is equal to or longer than a central height between a peripheral edge of a distal end of the connecting portion and an upper surface of the sealing layer. In this case, since the convection flow is reliably formed in the convection region, the sealing liquid drawn below the sealing layer is sucked into the convective flow in the convection region, remaining in the convection region. Furthermore, since the upper end of the folded portion is disposed at a high position in the first region, an amount of sealing liquid

flowing over the upper end of the folded portion from the convection region can be reduced. This can suppress outflow of the sealing liquid through the outlet, whereupon the sealing layer is less subject to thinning and foul odors can be prevented
5 from being produced.

[0020] The upper end of the folded portion may be located lower than an underside of the sealing layer. In this case, drawing the sealing liquid from the sealing layer can be suppressed when urine flows over the upper end of the folded portion from the
10 convection region to flow to the downstream side. This can suppress outflow of the sealing liquid through the outlet, whereupon the sealing layer is less subject to thinning and foul odors can be prevented from being produced.

[0021] The folded portion may be located at a middle position
15 between the partition wall and the sidewall. In this case, since the distance between the partition wall and the folded portion is equal to the distance between the folded portion and the sidewall, gel urinary calculi can be prevented from early accumulating at a specific place, whereupon the clogging due to
20 the accumulation of gel urinary calculi can be prevented.

[0022] Another urinal drain trap according to the invention including a lid fitted in an opening defined in a lower end of a urinal bowl surface and having an inlet into which urine having flowed along the urinal bowl surface further flows; a body having
25 a sidewall which is formed so as to extend downward from a peripheral edge of the lid, a bottom which is formed to be continuous to a lower end of the sidewall, and an outlet over which collected urine flows; and a hollow partition wall provided

inward of an outer circumferential edge of the lid and formed so as to extend downward from a closed upper end and having a lower end that is open with a distance between the bottom of the body and said lower end, wherein the body has an interior which is divided by the partition wall into a first region defined outside the partition wall and a second region defined inside the partition wall, the first and second regions communicating with each other via a third region defined below the lower end of the partition wall and above the bottom; and a sealing liquid that is water-insoluble and has a smaller specific gravity than urine is poured into the first region thereby to be formed into a sealing layer over remaining urine, the urinal drain trap being characterized in that the inlet is defined at a location where urine flows thereinto from above in the first region; and the outlet is formed in an upper end of an outflow conduit which rises from the bottom of the body in the second region and is disposed at a position biased in a direction in an interior of the partition wall in a planar view.

[0023] The outflow conduit is disposed at the position biased in one direction in the interior of the partition wall as the urinal drain trap is viewed in the planar view. This can increase the distance between an outer surface of the outflow conduit and the inner surface of the partition wall at the other side in the planar view. Consequently, an ascending flow path defined by the outer surface of the outflow conduit and the inner surface of the partition wall can be rendered hard to clog even when gel urinary calculi are accumulated on the outer surface of the outflow conduit and the inner surface of the partition wall.

[0024] Accordingly, the urinal drain trap according to the invention can desirably drain urine for a long period of time.

[0025] The outflow conduit may have a larger flow passage area than the ascending flow path defined by the outer surface of the outflow conduit and the inner surface of the partition wall as the second region is viewed in a top cross-section. In this case, since a flow rate of urine that can flow through the outflow conduit is larger than a flow rate of the urine that can flow through the ascending flow path, the outflow conduit can be prevented from being full of urine flowing through the ascending flowpath. This can prevent a siphon action caused by the outflow conduit full of urine. In other words, urine that should remain in the urinal drain trap can be prevented from being discharged due to occurrence of a siphon action, whereupon water seal can be prevented from disappearing. Furthermore, even when gel urinary calculi are accumulated on the inner surface of the downstream side of the outflow conduit, the situation can be retarded where the outflow conduit is full of urine flowing through the ascending flow path. Consequently, the urinal drain trap can desirably be used for a long period of time.

[0026] The partition wall may be formed so as to extend from a middle portion of the body toward an inner peripheral surface of the sidewall as the partition wall is viewed in a top cross-section. In this case, the flow path area of the outflow conduit can further be increased. Consequently, the outflow conduit can be prevented from being full of urine flowing through the ascending flow path, and occurrence of a siphon action can be prevented. Furthermore, the situation can be retarded where

gel urinary calculi are accumulated on the inner surface of the downstream side of the outflow conduit thereby to reduce the flow path area such that the outflow conduit is full of urine having flowed from the ascending flow path. Consequently, the urinal
5 drain trap can desirably be used for a long period of time.

[0027] The partition wall may be formed into a cylindrical shape, and the outflow conduit may be formed into a semi-circular cylindrical shape and disposed so that an arc-shaped outer surface thereof is located near the inner surface of the partition
10 wall. In this case, the flow path area of the outflow conduit can be increased while the space can be increased between the outer surface of the outflow conduit and the inner surface of the partition wall at the other side in the partition wall in planar view. This can ensure a sufficient amount of urine
15 flowing from the outflow conduit, whereupon urine can desirably be discharged.

[0028] The third region may have a vertical dimension that is larger than a transverse dimension of a descending flow path of urine formed in the first region and the ascending flow path of
20 urine in a vertically middle section. In this case, since the vertical dimension of the third region where gel urinary calculi are easily accumulated can be increased, the third region can be prevented from being early clogged even when gel urinary calculi accumulate in the third region.

25 [0029] A drain conduit is connected to the urinal drain trap and the trap may be formed into a cartridge type so as to be detachably attached to a recess that is upwardly open in the lower end of the urinal bowl surface. In this case, the whole cartridge

can be changed to another when an amount of the sealing liquid is reduced or when accumulation of gel urinal calculi results in the clogging. Consequently, maintenance can easily be carried out. Furthermore, since the clogging of the urinal drain trap due to accumulation of gel urinal calculi is suppressed,
5 an exchange frequency of the cartridge can be reduced.

Brief Description of the Drawings

[0030] FIG. 1 is a sectional view of a urinal having a urinal drain trap according to embodiment 1;

10 FIG. 2 is a sectional view of the urinal drain trap according to embodiment 1;

FIG. 3 is an exploded perspective view of the urinal drain trap according to embodiment 1;

FIGS. 4A and 4B are, a sectional view taken along line Q-Q in FIG. 2 of the urinal drain trap according to embodiment 1,
15 and a sectional view of the urinal drain trap according to embodiment 5, respectively;

FIG. 5 is a sectional view of the urinal drain trap according to embodiment 2;

20 FIG. 6 is a sectional view of the urinal drain trap according to embodiment 3;

FIG. 7 is a sectional view of the urinal drain trap according to embodiment 4;

FIG. 8 is a sectional view of the urinal drain trap according to embodiment 6;
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FIG. 9 is an exploded perspective view of the urinal drain trap according to embodiment 6;

FIG. 10 is a sectional view of the urinal drain trap

according to embodiment 6, the view taken along line Q-Q in FIG. 8;

FIG. 11 is a sectional view of the urinal drain trap according to embodiment 7; and

5 FIG. 12 is a sectional view of the urinal drain trap according to embodiment 7, the view taken along line Q-Q in FIG. 11.

Mode for Carrying Out the Invention

[0031] Embodiments 1 to 7 embodying the urinal drain trap of
10 the present invention will be described with reference to the drawings.

[0032] <Embodiment 1>

The urinal drain trap 10 according to embodiment 1 is formed into a cartridge type and detachably mounted in a recess 3 which
15 is upwardly open at a lower end of a bowl surface 2 of a urinal 1 as shown in FIGS. 1 to 3 and 4A. The urinal 1 is of a wall-mounted type and is fixed to a wall surface W of a toilet room R. The recess 3 is formed into a cylindrical storage container 20 which is mounted on a lower end of the bowl surface 2 of the urinal
20 1 and has an open upper end and a bottom.

[0033] The storage container 20 has an upper end to which a locking member 21 is connected. The locking member 21 is connected to an upper part of an inner surface of the storage container 20 and includes an upwardly extending cylindrical
25 portion 21A and a ring-shaped flange 21B spreading outward from an upper end of the cylindrical portion 21A. A locking recess 20A is formed in a middle part of the inner surface of the storage container 20. A locking convexity 12F provided on a sidewall

12A of a body 12 of the urinal drain trap 10 is locked in the locking recess 20A. The urinal drain trap 10 inserted in the storage container 20 is axially turned a predetermined angle such that the locking convexity 12F can be locked in the locking recess
5 20A. Thus, the urinal drain trap 10 of the cartridge type can detachably be mounted in the storage container 20.

[0034] A packing 22 is fitted with an outer surface of the locking member 21 and inserted from above into an opening 2A formed in a lower end of the bowl surface 2 of the urinal 1. The
10 flange 21B of the locking member 21 is locked to an upper surface of the peripheral edge defining the opening 2A. A ring-shaped fastening member 23 is fitted with the storage container 20 from below and screwed into a threaded portion formed in an upper outer surface of the storage container 20 so that an upper surface of
15 the fastening member 23 is locked to the underside of the peripheral edge of the opening 2A. The peripheral edge of the opening 2A is thus held between the flange 21B of the locking member 21 and the fastening member 23 so that the storage container 20 is mounted in the opening 2A. The storage container
20 20 has a connecting conduit 24 extending from a lower end corner thereof. The storage container 20 is connected via the connecting conduit 24 to a drain conduit 4 drawn to the wall surface W.

[0035] The urinal drain trap 10 of the cartridge type includes
25 a lid 11, a body 12 and a partition wall 13. The lid 11 has a circular contour shape. The lid 11 is fitted in the opening defined by the locking member 21 of the storage container 20, namely, the opening defined in the lower end of the bowl surface

2 of the urinal 1. A packing P is fitted in an annular recess formed in a circumferential end of the lid 11. As a result, the inner surface of the opening defined by the locking member 21 and the outer surface of the lid 11 are joined with each other in a watertight manner. Accordingly, urine having flowed along the bowl surface 2 of the urinal 1 further flows onto the upper surface of the lid 11. The lid 11 has inlets 11A which are formed therethrough and through which the urine having flowed along the bowl surface 2 further flows.

10 [0036] The body 12 includes a sidewall 12A, a bottom 12B and an outlet 12C. The sidewall 12A is formed into a cylindrical shape and extends downward from an outer circumferential edge of the lid 11. The outer circumferential edge of the lid 11 and an upper end of the sidewall 12A are adhered to each other without interspace therebetween. A plurality of locking convexities 12F is formed on a middle part of the outer surface of the sidewall 12A. The locking convexities 12F are locked in the locking recess 20A so that the urinal drain trap 10 is detachably mounted in the storage container 20, as described above. The bottom 12B is formed continuously on a lower end of the sidewall 12A.

25 [0037] The partition wall 13 is formed into a cylindrical shape and is provided inward of an outer circumferential edge of the lid 11. The partition wall 13 has a closed upper end and extends downward from the upper end thereof. The partition wall 13 has a lower end which is open while there is a distance between the bottom 12B of the body 12 and the lower end, whereby the partition wall 13 is hollow. The partition wall 13 is coaxial with the lid 11. The lid 11 has a plurality of divided inlets 11A disposed

along the outer surface of the partition wall 13 into the ring shape.

[0038] An interior of the body 12 is divided by the partition wall 13 into a first region 31 defined outside the partition wall 13 and a second region 32 defined inside the partition wall 13. The first and second regions 31 and 32 communicate with each other via a third region 33 defined below the lower end of the partition wall 13 and above the bottom 12B of the body 12. The first region 31 is filled with a sealing liquid that is water-insoluble, has a smaller specific gravity than urine and forms a sealing layer S over the remaining urine.

[0039] The partition wall 13 has a ring-shaped connecting portion 14 which is formed on the circumferential edge of the lower end thereof so as to extend in a lateral direction toward the first region 31. The connecting portion 14 is formed with a cylindrical folded portion 15 extending upward from a circumferential edge of a distal end thereof. A predetermined space is defined between the folded portion 15 and the partition wall 13. Furthermore, the folded portion 15 is located midway between the partition wall 13 and the sidewall 12A. More specifically, the folded portion 15, the partition wall 13 and the body 12 are disposed coaxially. Furthermore, the folded portion 15 has an upper end which extends upward so as to be located lower than the underside of the sealing layer S formed over the urine remaining in the body 12. The folded portion 15 extends so as to be located higher than a location of a middle point between the distal end circumferential edge of the connecting portion 14 and the upper surface of the sealing layer

S.

[0040] The outlet 12C is formed in an upper end of an outflow conduit 12D rising from the bottom 12B of the body 12 in the second region 32. The outlet 12C is open above the upper end of the folded portion 15. The outflow conduit 12D is formed into a semi-cylindrical shape and disposed with an arc-shaped outer surface thereof being in contact with the inner surface of the partition wall 13. More specifically, the outflow conduit 12D is arranged at a position biased in one direction in the interior of the partition wall 13 in a planar view.

[0041] The outflow conduit 12D includes a lower part that is bent along the bottom 12B of the body 12 toward the sidewall 12A. A drain hole 12E is formed through a part of the bottom 12B where a downstream end of the outflow conduit 12D is located. The cartridge type urinal drain trap 10 is mounted in the storage container 20 so that the drain hole 12E is located at a position facing an upstream part of the connecting conduit 24.

[0042] The third region 33 has a vertical dimension X that is larger than a lateral dimension of a urine descending flow path D formed in the first region 31 and a lateral dimension of a urine ascending flow path U formed in the second region 32 as viewed in a vertically middle section.

[0043] In the urinal drain trap 10 having the above-described construction, urine inflowing through the inlet 11A passes through the sealing layer S, flowing into the space between the partition wall 13 and the folded portion 15 from above. The urine changes from a downward flow to an upward flow in a region surrounded by the partition wall 13, the connecting portion 14

and the folded portion 15 (hereinafter, "convection region T"), with the result of occurrence of convection. The sealing layer S is agitated by the inflow of urine such that most of the sealing liquid drawn below the sealing layer is sucked into the convection.

5 Accordingly, the sealing liquid remains in the convection region T. When the convection ceases with stop of urinary inflow, the sealing liquid remaining in the convection region T emerges by buoyancy thereof, joining the upper sealing layer S.

[0044] Furthermore, when having flowed over an upper end of the
10 folded portion 15 from the convection region T and flowing along the urine descending flow path D toward the third region 33, the urine has a lower momentum than when flowing into the convection region T. Accordingly, when flowing over the upper end of the folded portion 15 from the convection region T while joining the
15 flow of urine, the sealing liquid is conveyed to the middle location of the urine descending flow path D, remaining there. Thus, the sealing liquid has less possibility of being conveyed to the third region 33. Upon cease of urinary flow, the sealing liquid remaining in the urine descending flow path D emerges by
20 buoyancy thereof, joining the upper sealing layer S.

[0045] Thus, the sealing liquid has less possibility of being conveyed to the third region 33 by the urinary flow. This can suppress outflow of the sealing liquid from the outlet 12C provided downstream relative to the third region. Consequently,
25 a reduction in the sealing liquid can be suppressed even in the use for a long period of time, and the sealing layer S is less subject to thinning.

[0046] Accordingly, the urinal drain trap 10 according to

embodiment 1 can prevent foul odors from being produced for a long period of time.

[0047] Furthermore, since the inlets 11A are divided into the plural inlets which extend along the outer surface of the partition wall 13 into a ring shape, urine inflowing through the inlets 11A is dispersed such that the momentum of urine flowing into the body 12 is dampened. This suppresses agitation of the sealing layer S due to urinal inflow, whereupon the sealing liquid has less possibility of being drawn below the sealing layer S. Consequently, outflow of the sealing liquid can further be suppressed. Furthermore, agitation of the sealing layer S is suppressed since the urine inflowing through the inlets 11A further flows downward along the outer surface of the partition wall 13. This can also suppress outflow of the sealing liquid. Consequently, the sealing layer S is less subject to thinning, and foul odors can be prevented from being produced.

[0048] Furthermore, since the predetermined space is defined between the folded portion 15 and the partition wall 13, convective flow can be caused in the entire convection region T. This can reduce an amount of sealing liquid flowing over the upper end of the folded portion 15 from the convection region T while the sealing liquid joins the flow of urine. Furthermore, even when having adhered to an inner surface of the convection region T, the gel urinary calculi have less possibility of being non-uniformly accumulated in the convection region T. Accordingly, outflow of the sealing liquid which could result from accumulation of gel urinary calculi at a specific portion can be suppressed, whereupon no convective flow is caused in the

portion. Consequently, the sealing layer S is less subject to thinning such that foul odors can be prevented from being produced.

[0049] Furthermore, since the folded portion 15 extends by a
5 length that is equal to or longer than a central height between
a peripheral edge of a distal end of the connecting portion 14
and an upper surface of the sealing layer S, the convective flow
is reliably formed in the convection region T, whereupon the
sealing liquid having been drawn below the sealing layer S is
10 sucked into the convective flow in the convection region T,
remaining in the convection region T. Furthermore, since the
upper end of the folded portion 15 is disposed at a high position
in the first region 31, an amount of sealing liquid flowing over
the upper end of the folded portion 15 from the convection region
15 T can be reduced. This can suppress outflow of the sealing liquid,
whereupon the sealing layer S is less subject to thinning and
foul odors can be prevented from being produced.

[0050] Furthermore, since the upper end of the folded portion
15 is located lower than an underside of the sealing layer S,
20 drawing the sealing liquid from the sealing layer S can be
suppressed when urine flows over the upper end of the folded
portion 15 from the convection region T to flow to the downstream
side. This can suppress outflow of the sealing liquid, whereupon
the sealing layer S is less subject to thinning and foul odors
25 can be prevented from being produced.

[0051] Furthermore, since the folded portion 15 is located
midway between the partition wall 13 and the sidewall 12A, gel
urinary calculi can be prevented from early accumulating in the

convection region T and at a specific place in the urine descending flow path D defined between the folded portion 15 and the sidewall 12A, whereupon the clogging due to the accumulation of gel urinary calculi can be prevented.

5 [0052] Furthermore, the third region 33 has a vertical dimension X that is larger than transverse dimensions Y and Z of the urine descending flow path D formed in the first region 31 and the urine ascending flow path U formed in the second region 32, as viewed in a vertically middle section. More specifically, since the
10 vertical dimension of the third region where gel urinary calculi are easily accumulated can be increased, the third region has less possibility of being clogged by the accumulation of gel urinary calculi. Consequently, urine can desirably be discharged.

15 [0053] Furthermore, since the urinal drain trap 10 is formed into a cartridge type, the whole cartridge can be changed to a new one when an amount of the sealing liquid has been reduced or accumulation of gel urinary calculi has resulted in the clogging. Consequently, maintenance can easily be carried out.

20 Furthermore, since the clogging of the urinal drain trap due to accumulation of gel urinary calculi is suppressed, an exchange frequency of the cartridge can be reduced.

[0054] Furthermore, in the urinal drain trap 10 having the above-described construction, the partition wall 13 is formed
25 into a cylindrical shape, and the outflow conduit 12D is formed into a semi-cylindrical shape and disposed with an arc-shaped outer surface in contact with the inner surface of the partition wall 13, whereupon the outflow conduit 12D is disposed at the

position biased to one side in the interior of the partition wall 13 as the urinal drain trap 10 is viewed in a planar view. This can increase the distance between an outer surface of the outflow conduit 12D and the inner surface of the partition wall 13 at the other side as the urinal drain trap 10 is viewed in the planar view. Consequently, an upward flow path defined by the outer surface of the outflow conduit 12D and the inner surface of the partition wall 13 can be rendered hard to clog even when gel urinary calculi accumulate on the outer surface of the outflow conduit 12D and the inner surface of the partition wall 13.

[0055] Accordingly, the urinal drain trap 10 according to the embodiment 1 can desirably drain urine for a long period of time.

[0056] Furthermore, the flow path area of the outflow conduit 12D can be increased while the distance between the outer surface of the outflow conduit 12D and the inner surface of the partition wall 13 at the other side in the partition wall 13 as the urinal drain trap 10 is viewed in the planar view. This can ensure a sufficient amount of urine flowing from the outflow conduit 12D, whereupon urine can desirably be discharged.

[0057] <Embodiment 2>

The urinal drain trap 110 according to embodiment 2 includes a body 112 directly mounted on a lower end of the bowl surface 2 of the urinal 1 as shown in FIG. 5. The locking member 21 is connected to the upper end of the body 112. The body 112 is inserted from above into the opening 2A formed in the lower end of the bowl surface 2, so that the flange 21B of the locking member 21 is locked by an upper surface of the peripheral portion of the opening 2A. A threaded portion is formed in an upper part

of the outer surface of the body 112. The ring-shaped fastening member 23 is fitted with the body 112 from below and has an upper surface which is locked to the underside of the peripheral edge of the opening 2A. The fastening member 23 is screwed into the threaded portion formed in the outer surface of the body 112. The peripheral edge of the opening 2A is thus held between the flange 21B of the locking member 21 and the fastening member 23, whereby the body 112 is mounted in the opening 2A.

[0058] Furthermore, the body 112 has the connecting conduit 124 extending from a lower end corner thereof. The connecting conduit 124 has an upstream end to which the outflow conduit 112D rising in the second region 32 is connected. The outflow conduit 112D has an upper end in which the outlet 112C is formed. The outlet 112C is open above the upper end of the folded portion 15. The outflow conduit 112D is formed into the semi-cylindrical shape and disposed with the arc-shaped outer surface thereof being in contact with the inner surface of the partition wall 13. More specifically, the outflow conduit 112D is arranged at a position biased in one direction in the interior of the partition wall 13 as viewed in the planar view. The connecting conduit 124 has a lower end connected to the drain conduit 4 drawn through the wall surface W.

[0059] Furthermore, the lid 11 is detachably attached to the body 112. Accordingly, when the body 112 is clogged due to accumulation of gel urinary calculi therein or the like, the lid 11 is detached and a cause of the clogging can be eliminated. The other construction of the urinal drain trap 110 according to the embodiment 2 is the same as that according to the embodiment

1. Identical parts in the embodiment 2 are labeled by the same reference symbols as those in the embodiment 1 and detailed description of these parts will be eliminated.

[0060] In the urinal drain trap 110 having the above-described
5 construction, too, much of the sealing liquid drawn below the sealing layer S is sucked into the convection caused in the convection region T, remaining in the convection region T. Accordingly, upon stop of urinary inflow, the sealing liquid remaining in the convection region T emerges by buoyancy thereof,
10 joining the upper sealing layer S. Furthermore, the sealing liquid flowing over the upper end of the folded portion 15 from the convection region T is conveyed to the middle of the urine descending flow path D but has less possibility of being conveyed to the third region 33. Upon cease of urinary flow, the sealing
15 liquid remaining in the urine descending flow path D emerges by buoyancy thereof, joining the upper sealing layer S. Thus, the sealing liquid has less possibility of being conveyed to the third region 33 by the urinary flow. This can suppress outflow of the sealing liquid through the outlet 12C provided downstream
20 relative to the third region 33. Consequently, a reduction in the sealing liquid can be suppressed even in the use for a long period of time, and the sealing layer S is less subject to thinning.

[0061] Accordingly, the urinal drain trap 10 according to
25 embodiment 2 can prevent foul odors from being produced for a long period of time.

[0062] Furthermore, in the urinal drain trap 110, the partition wall 13 is formed into a cylindrical shape, and the outflow

conduit 112D is formed into a semi-cylindrical shape and disposed with an arc-shaped outer surface in contact with the inner surface of the partition wall 13, whereupon the outflow conduit 112D is disposed at the position biased to one side in the interior of the partition wall 13 as viewed in a planar view. This can increase the distance between an outer surface of the outflow conduit 112D and the inner surface of the partition wall 13 at the other side as the urinal drain trap 110 is viewed in the planar view. Consequently, an upward flow path U defined by the outer surface of the outflow conduit 112D and the inner surface of the partition wall 13 can be rendered hard to clog even when gel urinary calculi are accumulated on the outer surface of the outflow conduit 112D and the inner surface of the partition wall 13.

[0063] Accordingly, the urinal drain trap 110 according to embodiment 2 can desirably drain urine for a long period of time.

[0064] <Embodiment 3>

In the urinal drain trap 210 according to embodiment 3, the outflow conduit 212D is formed into a cylindrical shape and is coaxial with the sidewall 212A of the body 212 as shown in FIG. 6. The outflow conduit 212D is also coaxial with the partition wall 13. As a result, the urine ascending flow path U is defined between the periphery of the outflow conduit 212D and the partition wall 13. The drain hole 212E facing the upstream portion of the connecting conduit 24 of the storage container 20 is formed in a central part of the bottom 212B of the body 212. The other construction of the urinal drain trap 210 according to the embodiment 3 is the same as that according to

the embodiment 1. Identical parts in the embodiment 3 are labeled by the same reference symbols as those in the embodiment 1 and detailed description of these parts will be eliminated.

[0065] In the urinal drain trap 210 having the above-described

5 construction, too, much of the sealing liquid drawn below the sealing layer S is sucked into the convection caused in the convection region T by the urinary inflow, remaining in the convection region T. Accordingly, upon stop of urinary inflow, the sealing liquid remaining in the convection region T emerges

10 by buoyancy thereof, joining the upper sealing layer S. Furthermore, the sealing liquid flowing over the upper end of the folded portion 15 from the convection region T is conveyed to the middle of the urine descending flow path D but has less possibility of being conveyed to the third region 33. Upon cease
15 of urinary flow, the sealing liquid remaining in the urine descending flow path D emerges by buoyancy thereof, joining the upper sealing layer S. Thus, the sealing liquid has less possibility of being conveyed to the third region 33 by the urinary flow. This can suppress outflow of the sealing liquid
20 through the outlet 212C provided downstream relative to the third region 33. Consequently, a reduction in the sealing liquid can be suppressed even in the use for a long period of time, and the sealing layer S is less subject to thinning.

[0066] Accordingly, the urinal drain trap 210 according to
25 embodiment 3 can prevent foul odors from being produced for a long period of time.

[0067] <Embodiment 4>

The urinal drain trap 310 of embodiment 4 includes the lid

311, the body 312 and the partition wall 313 as shown in FIG. 7. The body 312 has the sidewall 312A, the bottom 312B and the outlet 312C. The sidewall 312A is formed into a cylindrical shape and has a band-like convex portion 312D formed on the middle of the outer surface thereof. The body 312 is directly mounted to the lower end of the bowl surface 2 of the urinal 1 by the locking member 321. The locking member 321 has a cylindrical portion 321A surrounding an upper part of the body 312, a ring-shaped flange 321B which is continuous to an upper end of the cylindrical portion 321A and spreads outward and an annular recess 321C which is continuous to a lower end of the cylindrical portion 321A and engages with the convex portion 312D. The periphery of the opening 2A is formed in the lower end of the bowl surface 2 of the urinal 1. The locking member 321 further has a semi-circular locking portion 321D which holds the periphery of the opening 2A in cooperation with the flange 321B therebetween. The locking portion 321D is elastically movable and is elastically moved inward thereby to pass through the opening 2A from above, thereafter being moved outward. The locking portion 321D is thus locked by the underside of the peripheral edge of the opening 2A. The packing 22 is fitted with the outer surface of the locking member 321 between the flange 321B and the locking portion 321D.

[0068] The sidewall 312A is provided with an outlet 312C opening above the upper end of the folded portion 315 which will be described later. The body 312 is provided with the connecting conduit 324 extending laterally from the outlet 312C. The urinal drain trap 310 is connected via the connecting conduit 324

extending laterally from above to the drain conduit 4 drawn through the wall surface W.

[0069] The lid 311 has a circular outline. The lid 311 is fitted in an opening defined by the locking member 321 which mounts the
5 body 312 to the lower end of the bowl 2 of the urinal 1, namely, an opening defined in the lower end of the bowl surface 2 of the urinal 1. A packing P is fitted in the annular recess formed in the outer peripheral end surface of the lid 311. As a result, an inner surface of the opening formed by the locking member 321
10 is joined with the outer surface of the lid 311 in the water-tight manner, whereupon urine flowing downward along the bowl surface 2 of the urinal 1 further flows onto the upper surface of the lid 311. The lid 311 has the inlet 311A through which urine having flowed downward along the bowl surface 2 of the urinal
15 1 further inflows.

[0070] The partition wall 313 is formed into the cylindrical shape and provided inward of the outer circumferential edge of the lid 311. The partition wall 313 has a lower end which is open while there is a distance between the bottom 312B of the
20 body 312 and the lower end. The partition wall 313 is coaxial with the lid 311. The lid 311 has a plurality of divided inlets 311A disposed along the inner surface of the partition wall 313 into the ring shape.

[0071] An interior of the body 312 is divided by the partition
25 wall 313 into a first region 331 defined outside the partition wall 313 and a second region 332 defined inside the partition wall 313. The first and second regions 331 and 332 communicate with each other via a third region 333 located lower than the

lower end of the partition wall 313 and higher than the bottom 312B of the body 312. The second region 332 is filled with a sealing liquid that is water-insoluble, has a smaller specific gravity than urine and forms a sealing layer S over the remaining
5 urine.

[0072] The partition wall 313 has a ring-shaped connecting portion 314 which is formed on the inner circumferential edge of a lower end thereof so as to extend in a lateral direction toward the second region 332. The connecting portion 314 is
10 formed with a cylindrical folded portion 315 extending upward to the middle of the partition wall 313. The folded portion 315 is located at a predetermined distance from the partition wall 313. More specifically, the folded portion 315 and the partition wall 313 are coaxial with each other. Furthermore, the folded
15 portion 315 has an upper end which extends upward in the second region 332 so as to be located lower than the underside of the sealing layer S formed over the urine remaining in the body 312.

[0073] In the urinal drain trap 310 having the above-described construction, urine inflowing through the inlet 311A passes
20 through the sealing layer S, flowing into the space between the partition wall 313 and the folded portion 315 from above. The urine is shifted from a descending flow to an ascending flow in the convection region T surrounded by the partition wall 313, the connecting portion 314 and the folded portion 315, with the
25 result of occurrence of convection. The sealing layer S is agitated by the inflowing urine such that most of the sealing liquid drawn below the sealing layer S is sucked into the convection. Accordingly, the sealing liquid remains in the

convection region T. When the convection ceases with stop of urinary inflow, the sealing liquid remaining in the convection region T emerges by buoyancy thereof, joining the upper sealing layer S.

5 [0074] Furthermore, when flowing over the upper end of the folded portion 315 from the convection region T and then flowing along the urine descending flow path D toward the third region 333, the urine has a lower momentum than when flowing into the convection region T. Accordingly, when flowing over the upper
10 end of the folded portion 315 from the convection region T while joining the flow of urine, the sealing liquid is conveyed to the middle location of the urine descending flow path D, remaining there. Thus, the sealing liquid has less possibility of being conveyed to the third region 333. Upon cease of urinary flow,
15 the sealing liquid convecting in the urine descending flow path D emerges by buoyancy thereof, joining the upper sealing layer S.

[0075] Thus, the sealing liquid has less possibility of being conveyed to the third region 333 by the urinary flow. This can
20 suppress outflow of the sealing liquid through the outlet 312C provided downstream relative to the third region 333. Consequently, a reduction in the amount of sealing liquid can be suppressed even in the use for a long period of time, and the sealing layer S is less subject to thinning.

25 [0076] Accordingly, the urinal drain trap 310 according to embodiment 4 can prevent foul odors from being produced for a long period of time.

[0077] Furthermore, since the plural divided inlets 311A extend

along the inner surface of the partition wall 313 into the ring shape, urine inflowing through the inlets 311A is dispersed such that the momentum of urine flowing into the body 312 is dampened. This suppresses agitation of the sealing layer S due to urinary inflow, whereupon the sealing liquid has less possibility of being drawn below the sealing layer S. Consequently, outflow of the sealing liquid can further be suppressed. Furthermore, agitation of the sealing layer S is suppressed since the urine inflowing through the inlets 311A further flows downward along the inner surface of the partition wall 313. This can also suppress outflow of the sealing liquid. Consequently, the sealing layer S is less subject to thinning, and foul odors can be prevented from being produced.

[0078] Furthermore, since the folded portion 315 is located with a predetermined space from the partition wall 313, the convective flow can be caused in the entire convection region T. This can reduce an amount of sealing liquid flowing over the upper end of the folded portion 315 from the convection region T while the sealing liquid joins the flow of urine. Consequently, outflow of sealing liquid can be suppressed. Furthermore, even when having adhered to an inner surface of the convection region T, the gel urinary calculi have less possibility of non-uniformly accumulating in the convection region T. Accordingly, outflow of the sealing liquid which could result from accumulation of gel urinary calculi at a specific portion can be suppressed, whereupon no convective flow is caused in the portion. Consequently, the sealing layer S is less subject to thinning such that foul odors can be prevented from being produced.

[0079] Furthermore, since the upper end of the folded portion 315 is located lower than the underside of the sealing layer S, drawing the sealing liquid from the sealing layer S can be suppressed when urine flows over the upper end of the folded
5 portion 315 from the convection region T to flow to the downstream side. This can suppress outflow of the sealing liquid, whereupon the sealing layer S is less subject to thinning and foul odors can be prevented from being produced.

[0080] Furthermore, since the urine descending flow path D
10 having a large flow path area is formed in the folded portion 315, gel urinary calculi do not early accumulate and the clogging due to accumulation of gel urinary calculi can be suppressed.

[0081] <Embodiment 5>

The urinal drain trap 410 of embodiment 5 includes the
15 outflow conduit 412D formed into a cylindrical shape as shown in FIG. 4B. The outflow conduit 412D has an outer surface in contact with the inner surface of the partition wall 13. More specifically, the outflow conduit 412D is disposed at the position biased to one side in the interior of the partition wall
20 13 as the urinal drain trap 410 is viewed in a planar view. The other construction of the urinal drain trap 410 according to the embodiment 5 is the same as that according to the embodiment 1. Identical parts in the embodiment 5 are labeled by the same reference symbols as those in the embodiment 1 and detailed
25 description of these parts will be eliminated.

[0082] In the urinal drain trap 410 having the above-described construction, the distance can be increased between the outer surface of the outflow conduit 412D and the inner surface of the

partition wall 13 at the other side in the partition wall 13 as the urinal drain trap 410 is viewed in the planar view. Consequently, the urine ascending flow path U defined by the outer surface of the outflow conduit 412D and the inner surface of the partition wall 13 can be rendered hard to clog even when gel urinary calculi have accumulated on the outer surface of the outflow conduit 412D and the inner surface of the partition wall 13.

[0083] Accordingly, the urinal drain trap 410 according to embodiment 5 can desirably drain urine for a long period of time.

[0084] <Embodiment 6>

The urinal drain trap 510 of embodiment 6 includes the lid 511, the body 512 and the partition wall 513 as shown in FIGS. 8 to 10. The lid 511 has inlets 511A which are formed therethrough and into which the urine having flowed along the bowl surface 2 of the urinal 1 further flows. The body 512 includes the sidewall 512A, the bottom 512B and the outlet 512C. A plurality of locking convexities 512F is formed on the middle part of the outer surface of the sidewall 512A.

[0085] The partition wall 513 extends from a central part of the body 512 toward the sidewall 512A and is hollow as viewed in a top cross-section. Furthermore, the partition wall 513 has a side which extends toward the sidewall 512A and has an outer surface in contact with the inner surface of the sidewall 512A. The partition wall 513 includes a part which is located at the central side of the body 512 and is formed into a semi-circularly annular shape as viewed in the top cross-section. The lid 512 has a plurality of divided inlets 511A formed along the outer

surface of the aforementioned part of the partition wall 513. The partition wall 513 includes one part which is located at the central side of the body 512 and formed into a generally semi-circular shape and the other part which is formed into a rectangular shape and has a diameter of the semicircle as a short side thereof, as viewed in the top cross-section. The rectangular part extends from the short side toward the sidewall 512A. The semicircular part defines a semicircular interior therein and the rectangular part defines a rectangular interior therein as the partition wall 513 is viewed in the top cross-section thereof.

[0086] The interior of the body 512 is divided by the partition wall 513 into the first region 531 defined outside the partition wall 513 and the second region 532 defined inside the partition wall 513. The first and second regions 531 and 532 communicate with each other via the third region 533 defined below the lower end of the partition wall 513 and above the bottom 512B of the body 512. The first region 531 is filled with the sealing liquid that is water-insoluble, has a smaller specific gravity than urine and forms the sealing layer S over the remaining urine.

[0087] The urinal drain trap 510 includes the folded portion 515 which is formed at equal distance from the inner surface of the sidewall 512A so that the partition wall 513 connects an outer surface of one of two side surfaces extending from the central part of the body 512 toward the sidewall 512A to the other outer surface. The lower end of the folded portion 515 and a part of the lower end of the partition wall 513 are connected together by a connecting portion 514. The upper end of the folded portion

515 upwardly extends in the first region 531 to a position located lower than the underside of the sealing layer S formed above the urine stored in the body 512. Furthermore, the folded portion 515 extends over the central height between the distal end peripheral portion of the connecting portion 514 and the upper surface of the sealing layer S.

[0088] The outlet 512C is formed in an upper end of the outflow conduit 512D rising from the bottom 512B of the body 512 in the second region 532. The outlet 512C is open above the upper end of the folded portion 515. The outflow conduit 512D has a rectangular opening section and also a rectangular top section of the outer surface. The outflow conduit 512D includes three-directional outer surface which is disposed so as to be in contact with an inner surface of a part of the partition wall 513, which part is formed so as to define a rectangular interior as viewed in a top cross-section. More specifically, the outflow conduit 512D is arranged at a position biased in one direction in the interior of the partition wall 513 as the urinal drain trap 510 is viewed in a planar view.

[0089] The ascending flow path U is defined by a part in which the outer surface of the outflow conduit 512D and the inner surface of the partition wall 513 are not in contact with each other and which is surrounded by the outer surface of the outflow conduit 512D and the inner surface of the partition wall 513. The outflow conduit 512D is formed so as to have a larger flow path area than the ascending flow path U as the second region 532 is viewed in a top cross-section.

[0090] The outflow conduit 512D has a lower part which is open

downward. The outflow conduit 512D has at a downstream end thereof a bottom 512B through which an outlet 512E is formed. The urinal drain trap 510 of the cartridge type is mounted in the storage container 20 so that the outlet 512E is disposed at
5 a position facing the upstream part of the connecting conduit 24 of the storage container 20. The other construction of the urinal drain trap according to the embodiment 6 is the same as that according to the embodiment 1. Identical parts in the embodiment 5 are labeled by the same reference symbols as those
10 in the embodiment 1 and detailed description of these parts will be eliminated.

[0091] In the urinal drain trap 510 having the above-described construction, too, since the outflow conduit 512D is disposed at the position biased in one direction in the interior of the
15 partition wall 513, the space between the outer surface of the outflow conduit 512D and the inner surface of the partition wall 513 can be increased, as the urinal drain trap 510 is viewed in a planar view. Consequently, the ascending flow path U defined by the outer surface of the outflow conduit 512D and the inner
20 surface of the partition wall 513 can be rendered hard to clog even when gel urinary calculi have accumulated on the outer surface of the outflow conduit 512D and the inner surface of the partition wall 513.

[0092] Accordingly, the urinal drain trap 510 according to
25 embodiment 6 can desirably drain urine for a long period of time.

[0093] Furthermore, since the outflow conduit 512D has a larger flow passage area than the ascending flow path U as the second region 532 is viewed in a top cross-section, a flow rate of the

urine that can flow through the outflow conduit 512D is larger than a flow rate of the urine that can flow through the ascending flow path U. Accordingly, the outflow conduit 512D can be prevented from being full of urine flowing through the ascending
5 flow path U. This can prevent a siphon action caused by the outflow conduit 512D full of urine. In other words, urine that should remain in the urinal drain trap 510 can be prevented from being discharged due to occurrence of a siphon action, whereupon water seal can be prevented from disappearing. Furthermore,
10 even when gel urinary calculi have accumulated on the inner surface of the downstream side of the outflow conduit 512D, the situation can be retarded where the outflow conduit 512D is full of urine flowing through the ascending flow path U. Consequently, the urinal drain trap 510 can desirably be used for a long period
15 of time.

[0094] Furthermore, the flow path area of the outflow conduit 512D can further be increased since the partition wall 513 is formed so as to extend from a middle portion of the body 512 toward the sidewall 512A as the urinal drain trap 510 is viewed in the
20 top cross-section. Consequently, the outflow conduit 512D can be prevented from being full of urine flowing from the ascending flow path U, and occurrence of a siphon action can be prevented. Furthermore, the situation can be retarded where gel urinary calculi accumulate on the inner surface of the downstream side
25 of the outflow conduit 512D thereby to reduce the flow path area such that the outflow conduit 512D is full of urine flowing from the ascending flow path U. Consequently, the urinal drain trap 510 can desirably be used for a long period of time.

[0095] Furthermore, since the lower part of the outflow conduit 512D is downwardly open, urine can be discharged from the outflow conduit 512D directly into the storage container 20. Consequently, the outflow conduit 512D can be prevented from
5 being full of urine flowing from the ascending flow path U, and occurrence of a siphon action can be prevented.

[0096] <Embodiment 7>

In the urinal drain trap 560 according to embodiment 7, a part of the partition wall 513 in contact with the inner surface
10 of the sidewall 512A is formed integrally with the sidewall 512A, and a part of the outflow conduit 512D in contact with the inner surface of the partition wall 513 is formed integrally with the partition wall 513 in the urinal drain trap 510 according to embodiment 6, as shown in FIGS. 11 and 12. Consequently, the
15 urinal drain trap 560 can easily be manufactured and an amount of raw materials to be consumed can be reduced.

[0097] The outflow conduit 512D forming the ascending flow path U of the urinal drain trap 560 has an upper end formed into a rounded or curved surface and a convex portion formed to be
20 continuous from the rounded surface and having a substantially semicircular shape in the vertical section. Accordingly, when flowing from the ascending flow path U into the outflow conduit 512D, urine can smoothly flow over the upper end of the outflow conduit 512D. The other construction of the urinal drain trap
25 560 according to the embodiment 7 is the same as that according to the embodiment 6. Identical parts in the embodiment 7 are labeled by the same reference symbols as those in the embodiment 6 and detailed description of these parts will be eliminated.

[0098] In the urinal drain trap 560 having the above-described construction, too, since the outflow conduit is disposed at the position biased in one direction in the interior of the partition wall 513, the space between the outer surface of the outflow conduit and the inner surface of the partition wall 513 can be increased, as the urinal drain trap 560 is viewed in a planar view. Consequently, the ascending flow path U defined by the outer surface of the outflow conduit and the inner surface of the partition wall 513 can be rendered hard to clog even when gel urinary calculi accumulate on the outer surface of the outflow conduit and the inner surface of the partition wall 513.

[0099] Accordingly, the urinal drain trap 560 according to embodiment 7 can desirably drain urine for a long period of time.

[0100] Furthermore, since a part corresponding to the outflow conduit has a larger flow passage area than the ascending flow path U as the second region 532 is viewed in a top cross-section, a flow rate of the urine that can flow through the part corresponding to the outflow conduit is larger than a flow rate of the urine that can flow through the ascending flow path U. Accordingly, the part corresponding to the outflow conduit can be prevented from being full of urine flowing through the ascending flow path U. This can prevent a siphon action caused by the part corresponding to the outflow conduit full of urine. In other words, urine that should remain in the urinal drain trap 560 can be prevented from being discharged due to occurrence of a siphon action, whereupon water seal can be prevented from disappearing. Furthermore, even when gel urinary calculi accumulate on the inner surface of the downstream side of the

part corresponding to the outflow conduit, the situation can be retarded where the part corresponding to the outflow conduit is full of urine flowing through the ascending flow path U. Consequently, the urinal drain trap 560 can desirably be used
5 for a long period of time.

[0101] Furthermore, the flowpath area of the part corresponding to the outflow conduit can further be increased since the partition wall 513 is formed so as to extend from a middle portion of the body 512 toward the sidewall 512A as viewed in the top
10 cross-section. Consequently, the part corresponding to the outflow conduit can be prevented from being full of urine flowing through the ascending flow path U, and occurrence of a siphon action can be prevented. Furthermore, the situation can be retarded where gel urinary calculi accumulate on the inner
15 surface of the downstream side of the part corresponding to the outflow conduit thereby to reduce the flow path area such that the part corresponding to the outflow conduit is full of urine flowing through the ascending flow path U. Consequently, the urinal drain trap 560 can desirably be used for a long period
20 of time.

[0102] Furthermore, since the lower part of the part corresponding to the outflow conduit is downwardly open, urine can be discharged from the part corresponding to the outflow conduit directly into the storage container 20. Consequently,
25 the part corresponding to the outflow conduit can be prevented from being full of urine flowing through the ascending flow path U, and occurrence of a siphon action can be prevented.

[0103] The present invention should not be limited to the

embodiments 1 to 7 described above with reference to the drawings. For example, the technical scope of the invention encompasses the following embodiments:

- 5 (1) Although the urinal drain trap has a cylindrical outer shape in each of the embodiments 1 to 7, the outer shape of the urinal drain trap may not be cylindrical. In this case, each of the partition wall and the folded portion may not be circularly cylindrical in shape either but may have a mere cylindrical shape along the sidewall of the body.
- 10 (2) The upper end of the folded portion may be located in the sealing layer although formed so as to be located lower than the underside of the sealing layer in each of the embodiments 1 to 7.
- 15 (3) The outflow conduit may not be semi-circularly cylindrical in shape although formed into the semi-circularly cylindrical and disposed so that the arc-shaped outer surface thereof is in contact with the inner surface of the partition wall in each of the embodiments 1 and 2.
- 20 (4) The body may be formed integrally with a urinal body although directly mounted to the lower end of the bowl surface of the urinal in the embodiment 2.
- 25 (5) The outflow conduit may be disposed at the position biased in one direction in the interior of the partition wall without being in contact with the inner surface of the partition wall, as the urinal drain trap is viewed in the planar view, although disposed with the outer surface thereof being in contact with the inner surface of the partition wall in each of the embodiments 1, 2, 5 and 6.

Industrial Applicability

[0104] The present invention is applicable to urinals in which no flushing water is used.

Explanation of Reference Symbols

- 5 [0105] 1 ... urinal
2 ... bowl surface
10, 110, 210, 310, 410, 510, 560 ... urinal drain trap
11, 311, 511 ... lid
11A, 311A, 511A ... inlet
10 12, 112, 212, 312, 512 ... body
12A, 112A, 212A, 312A, 512A ... sidewall
12B, 112B, 212B, 312B, 512B ... bottom
12C, 112C, 212C, 312C, 512C ... outlet
12D, 112D, 212D, 312D, 512D ... outflow conduit
15 13, 313, 513 ... partition wall
14, 314, 514 ... connecting portion
15, 315, 515 ... folded portion
31, 331, 531 ... first region
32, 332, 532 ... second region
20 33, 333, 533 ... third region
S ... sealing layer

Claims

1. A urinal drain trap including:

a lid fitted in an opening defined in a lower end of a urinal bowl surface and having an inlet through which urine flowing along
5 the urinal bowl surface further flows;

a body having a sidewall which is formed so as to extend downward from a peripheral edge of the lid, a bottom which is formed to be continuous to a lower end of the sidewall, and an outlet over which collected urine flows; and

10 a hollow partition wall provided inward of an outer circumferential edge of the lid and having a lower end that is open with a distance between the bottom of the body and said lower end, wherein:

the body has an interior which is divided by the partition
15 wall into a first region defined outside the partition wall and a second region defined inside the partition wall, the first and second regions communicating with each other via a third region defined below the lower end of the partition wall and above the bottom; and

20 a sealing liquid that is water-insoluble and has a smaller specific gravity than urine is poured into either the first or the second region thereby to be formed into a sealing layer over remaining urine, the urinal drain trap being characterized in that:

25 the lower end of the partition wall has a peripheral edge that is formed with a connecting portion extending in a lateral direction toward one of the first and second regions, the connecting portion having a distal end peripheral edge formed

with a folded portion extending upward; and

the inlet is defined between the partition wall and the folded portion so that urine flows thereinto from above, and the outlet is open above an upper end of the folded portion within
5 the other of said first and second regions.

2. The urinal drain trap according to claim 1, wherein the inlet is defined so as to extend along the partition wall.

10 3. The urinal drain trap according to claim 1 or 2, wherein a predetermined space is defined between the folded portion and the partition wall.

4. The urinal drain trap according to claim 1 or 2, wherein
15 the folded portion extends by a length that is equal to or longer than a central height between a peripheral edge of a distal end of the connecting portion and an upper surface of the sealing layer.

20 5. The urinal drain trap according to claim 1 or 2, wherein the upper end of the folded portion is located lower than an underside of the sealing layer.

6. The urinal drain trap according to claim 1 or 2, wherein
25 the folded portion is located at a middle position between the partition wall and the sidewall.

7. The urinal drain trap according to claim 1 or 2, wherein

the outlet is formed in an upper end of an outflow conduit which rises from the bottom of the body in the second region and is disposed at a position biased in a direction in an interior of the partition wall in a planar view.

5

8. A urinal drain trap including:

a lid fitted in an opening defined in a lower end of a urinal bowl surface and having an inlet into which urine having flowed along the urinal bowl surface further flows;

10 a body having a sidewall which is formed so as to extend downward from a peripheral edge of the lid, a bottom which is formed to be continuous to a lower end of the sidewall, and an outlet over which collected urine flows; and

a hollow partition wall provided inward of an outer
15 circumferential edge of the lid and formed so as to extend downward from a closed upper end and having a lower end that is open with a distance between the bottom of the body and said lower end, wherein:

the body has an interior which is divided by the partition
20 wall into a first region defined outside the partition wall and a second region defined inside the partition wall, the first and second regions communicating with each other via a third region defined below the lower end of the partition wall and above the bottom; and

25 a sealing liquid that is water-insoluble and has a smaller specific gravity than urine is poured into the first region thereby to be formed into a sealing layer over remaining urine, the urinal drain trap being characterized in that:

the inlet is defined at a location where urine flows thereinto from above in the first region; and

the outlet is formed in an upper end of an outflow conduit which rises from the bottom of the body in the second region and
5 is disposed at a position biased in a direction in an interior of the partition wall in a planar view.

9. The urinal drain trap according to claim 8, wherein the outflow conduit has a larger flow passage area than an ascending
10 flow path defined by an outer surface of the outflow conduit and an inner surface of the partition wall as the second region is viewed in a top cross-section.

10. The urinal drain trap according to claim 8 or 9, wherein
15 the partition wall is formed so as to extend from a middle portion of the body toward an inner peripheral surface of the sidewall in a top cross-section of the partition wall.

11. The urinal drain trap according to claim 8 or 9, wherein
20 the partition wall is formed into a cylindrical shape, and the outflow conduit is formed into a semi-circular cylindrical shape and disposed so that an arc-shaped outer surface is located near the inner surface of the partition wall.

25 12. The urinal drain trap according to claim 8 or 9, wherein the third region has a vertical dimension that is larger than a transverse dimension of a urine descending flow path formed in the first region and the ascending flow path in a vertically

middle section.

13. The urinal drain trap according to any one of claims
1, 2, 8 and 9, to which a drain conduit is connected and which
5 is formed into a cartridge type so as to be detachably attached
to a recess that is upwardly open in the lower end of the urinal
bowl surface.