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(54) **Urinal sanitizing device**

(57) A sanitizing assembly for a urinal includes a first soluable sanitizing block (2) comprising at least one of a disinfectant, deodorizing, bacterial and surfactant substance, and a second fragrance block (5) comprising a fragrant substance. The second fragrance block (5) is secured to the first sanitizing block (2). As the sanitizing

block (2) is dissolved from below the fragrance block (5) is supported away from the dissolving fluid by the block (2). Once the sanitizing block (2) has dissolved the fragrance block (5) remains within a urinal block housing as a visual and fragrant indication that sanitization is occurring while the dissolved sanitizing block (2) continues to function in the waste trap.

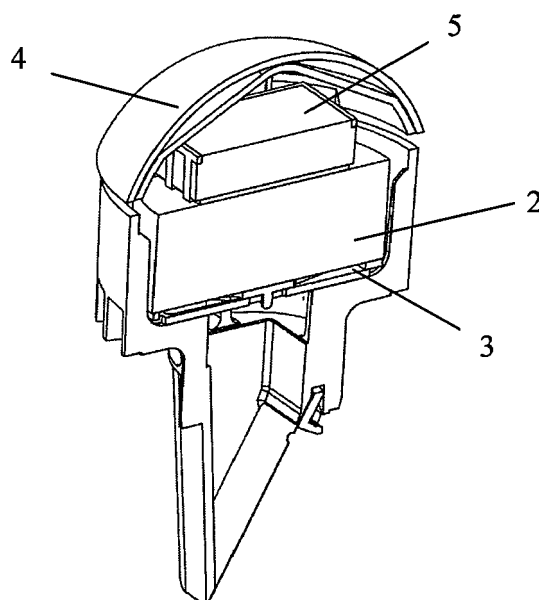


Fig 1

Description

[0001] The present invention relates to a urinal sanitizing device for a toilet, and in particular a sanitising block assembly for use in a urinal waste outlet assembly.

[0002] Odour control and sanitisation are concerns within the field of urinal waste outlets, and in particular reduced flush or 'waterless' urinals. A common means of odour prevention is to position an anti-bacterial and/or deodorising agent within the urinal or vicinity thereof. The agent is typically a solid block or 'cake' of disinfectant which dissolves upon contact with urine or water, thus releasing its anti-bacterial and deodorising compounds. The greater the exposure to the fluid, the faster the rate of dissolution.

[0003] Fluid contacting the block includes both urine and flush water. In order to prevent blockages and the build up of bad odours, it is necessary to flush a urinal system on a regular basis. However, such regular flushing is considered environmentally unfriendly. Therefore, 'waterless' urinal blocks have been developed which act to prevent blockage and malodour with requiring flushing.

[0004] Waterless urinal block contain a number of active ingredients, including surfactants, but the most important of these is the microbial spores. The urinal blocks are placed dispensers which obscure the blocks from view in normal use, while allowing the blocks to come into contact with the urine during use. The urine begins to dissolve the blocks, which becomes entrained in the urine flow. Once taken down into the trap with the urine, the spores become active beneficial bacteria that 'feed' upon the urine and then multiply. By breaking down the urine into components, the bacteria from the block prevent the build-up of sludge and crystals that are a major contributing cause to blockages. They also generate an environment hostile to the 'bad' bacteria that cause odours.

[0005] Even after the block has completely dissolved, the active components remain the waste trap for a significant time preventing odour and blockage. However, this process is not commonly understood by maintenance operators servicing washrooms on a daily basis. Therefore, once the blocks have visibly disappeared a maintenance worker will usually inform the periodic maintenance service provider that replacement blocks are required resulting in an unnecessary call out.

[0006] In addition to odour and blockage prevention, it is also desirable for sanitizer blocks to actively generate a pleasant odour, to re-assure users of their efficacy. However, it is often difficult to provide waterless blocks with a fragrance element of sufficient strength. In addition, once the block has completely dissolved, although it is still active within the trap the fragrance is no longer being released.

[0007] Therefore, it is desirable to provide an improved sanitising device which addresses the above described problems and/or which provides improvements generally.

[0008] According to the present invention there is provided a sanitizing device as described in the accompanying claims.

[0009] In accordance with an embodiment of the present invention, there is provided a sanitizing assembly for a urinal, the assembly comprising a first soluble sanitizing block comprising at least one of a disinfectant, deodorizing, bacterial and surfactant substance; and a second fragrance block comprising a fragrant substance, wherein the second fragrance block is secured to the first sanitizing block. The fragrance block is preferably secured to the upper surface of the sanitizing block. In this way, as the sanitizing block is dissolved from below the fragrance block is supported away from the dissolving fluid by the block. Therefore, once the sanitizing block has dissolved the fragrance block remains within a urinal block housing as a visual and fragrant indication that sanitization is occurring while the dissolved sanitizing block continues to function in the waste trap.

[0010] Preferably the second fragrance block is supported and held on a support member formed from a non-soluble material, the support member being coupled to the first soluble block to secure the second fragrance block thereto. Once the sanitizing block has dissolved the support member continues to shield the fragrance block from fluid contact from beneath, to limit the release of the fragrance block material into the waste outlet.

[0011] The support member is preferably configured to support the second fragrance block within a urinal when the first soluble block has dissolved. The support member thereby prevents the fragrance block from falling into the waste outlet following dissolution of the sanitizing block, which is desirable as the release of such materials into the water system is restricted by current regulations.

[0012] The support member may comprise an enclosure having a base and a plurality of walls extending upwardly from the base. The walls contain and enclose the sanitizing block.

[0013] The base preferably comprises a solid planar member, and the walls include a plurality of apertures. The solid base prevents liquid from contacting the base from below, thereby limiting dissolution of the block, while the apertures in the walls provide an increased fragrance release from the block.

[0014] The enclosure defines a cage for housing the fragrance block. More specifically, the plurality of walls may each comprise a plurality of castellations, with the spaces between the castellated portions defining the fragrance release apertures.

[0015] The enclosure includes at least one open portion configured such that the fragrance is externally visible and to permit fragrance release therefrom. Preferably the upper face of the enclosure is at least partially open to permit the block to be viewed from above.

[0016] The support member may comprise at least one connection member for securing the support member to the sanitizing block.

[0017] The at least one connection member may com-

prise at least one tapered projection defining a securing spike configured to be inserted into the sanitizing block to secure the support member thereto. The at least one spike extends downwardly from the base of the support member.

[0018] In a further embodiment of the invention there is provided a support device for a toilet sanitizing block comprising a sanitizing device as described above and an enclosure for housing the sanitizing device, the enclosure comprising a cover section and a base having at least one aperture formed therein. The support member and the at least one aperture are configured such that the support member is supported on the base and unable to pass through the at least one aperture to ensure the support member is retained within the housing. As such, even when the sanitizing block has completely dissolved, the fragrance block remains supported within the housing and is prevented from passing through the aperture in the base even when it is almost completely dissolved.

[0019] The base preferably comprises a grate or grill having a plurality of apertures formed therein.

[0020] The housing preferably comprises attachment means for coupling the housing to a waste outlet of a urinal.

[0021] In another aspect of the invention, a support device for a urinal fragrance block is provided comprising a base and a plurality of walls defining an enclosure for a fragrance block. The enclosure has at least one open portion configured to permit the release of fragrance from the block, and at least one securing member configured for securing the support member to a urinal sanitizing block.

[0022] The at least one connection member may comprise at least one tapered projection defining a securing spike configured to be inserted into the sanitizing block to secure the support member thereto.

[0023] The present invention will now be described by way of example only with reference to the following illustrative figures in which:

Figure 1 shows a section view through a waste of the present invention;

Figure 2 shows the waste outlet assemble of figure 1 with the cap removed;

Figure 3 shows a combined sanitizing and fragrance block assembly according to an aspect of the present invention;

Figure 4 shows the enclose of the assembly of figure 4;

Figure 5 is a section view of the arrangement of figure 3; and

Figure 6 shows a support apparatus for the assembly of the present invention.

[0024] Referring to Figure 1, a waste outlet assembly 1 for a reduced flush urinal incorporates a housing for a block of dissolvable disinfectant and/or deodorizing material 2. The housing comprises a support member 3 and a cover 4. The support member 3 comprises a grid or mesh like support platform having a plurality of apertures formed therein, the grid being configured to support the sanitizing block 2. Liquid (such as water and urine) passes into and out of the assembly 1 via the support platform grid 3, coming into contact with and partially dissolving the block 2 while in transit.

[0025] The block 2 is a waterless urinal block comprising bacterial matter to actively prevent the formation of bad odors when present in the waste trap. As such, even when the block 2 is completely dissolved it continues to function while present in the waste trap. However, the lack of visual presence within the housing when the block 2 has dissolved can lead maintenance staff to wrongly believe the block is no longer working and result in the block 2 being replaced too soon. In situations where the toilet facility is maintained by a service contractor, the incorrect opinion that replacement of the block 2 is required results in an unnecessary and premature service call out.

[0026] Figures 2 and 3 show an embodiment of the present invention, in which a fragrance block 5 is provided in addition to the sanitizing block 2. The fragrance block 5 is formed from a material configured to release a pleasing fragrance over a controlled time period, which provides a positive indication of sanitization to compliment and re-enforce the odor preventing action of the sanitizing block. The fragrance block 5 is supported on top of the sanitizing block 2 such that the fragrance block 5 is visible from above. In this way, the fragrance block 5 is immediately visible when the housing is opened for inspection.

[0027] The sanitizing block 2 supports the fragrance block 5 in a vertically spaced location from the support member 3, and as such limits the exposure of the fragrance block 5 to liquid entering the housing through the apertures of the support member 3. Therefore, as the sanitizing block dissolves due to liquid contact, the rate of dissipation of the fragrance block 5 is significantly slower.

[0028] The fragrance block 5 may be secured directly to the upper surface of the sanitizing block 2, by any suitable means. For example the fragrance block 5 and sanitizing block 2 may be formed together in a two stage molding operation to form a single unitary, dual-component block. However, in the arrangement of Figures 2 and 3 an enclosure 6 is provided to house and retain the fragrance block 5. As shown in Figure 4, the enclosure 6 comprises a base 8 having a square shape corresponding to the shape of the fragrance block 5. It will be appreciated the fragrance block 5 and enclosure 6 may be any suitable shape, with a square configuration being preferable as it enables easier manufacture of the enclosure 5.

[0029] A plurality of walls 10 extend upwardly at the peripheral edges of the base 8. The walls 10 are configured such that their height is substantially equal to the height of the fragrance block, and their upper edges are flush with the upper surface of the fragrance block 5 when it is supported on the base 8. This configuration maximises that use of materials for the enclosure 6, and hence minimises cost, by avoiding redundant material extending above the fragrance block 5. Limiting the height of the enclosure 6 also optimizes the space occupied by the enclosure 6 within the housing 4.

[0030] The base 8 is a continuous planar member. Each wall 10 comprises multiple upright enclosure members 12 spaced apart to define apertures 14, such that each wall comprises a substantially castellated configuration. Preferably a cross member 16 extends across the top of each wall 10, interconnecting the upright members 12 and providing increased structural rigidity.

[0031] The upper face 18 of the enclosure 6 opposing the base 8 is open. As such, when the fragrance block 5 is contained within the enclosure 6 it is permanently visible through the upper opening of the face 18 until such a time that it is completely dissolved or replaced. The open upper face 18 also facilitates the release of fragrance by the fragrance block 6. The apertures 14 further increase the fragrance release of the fragrance block 6. The base 8 is however maintained as a continuous member to minimize contact of the fragrance block 6 with liquid entering the assembly 1 through the base.

[0032] As shown in Figure 5, a plurality of tapered projections 20 defining spikes extend from the underside of the base 8. The spikes 20 enable the enclosure 6 to be secured to the block 2. In use, the enclosure 6 containing the fragrance block 5 is placed on top of the block 2 and pressure is applied causing the spikes 20 to extend into an embed themselves in the block 2 to anchor the enclosure 6 to the block 2. As such, the enclosure 6, fragrance block 5 and sanitizing block 2 may be preassembled and connected and supplied as a single piece consumable unit. Alternatively, the enclosure 6 may be reusable

[0033] The housing comprises a support section, including the support member 3 and a side wall section, and a cap section (not shown) which covers the support section preventing direct contact of fluid with sanitizing 2 and fragrance 5 blocks from above, and obscuring them from view in normal use. Fluid flow into and out of the housing is permitted through the apertures in the support member 3. By preventing direct fluid contact from above, the housing 11 limits the dissolution of the sanitizing block 2 and the fragrance block 5, as well excessive and unnecessary release of the disinfectant and/or deodorizing material.

[0034] As liquid enters the housing through the apertures in the support member 3, it begins to dissolve the sanitizing block 2. As the sanitizing block 2 dissolves, the enclosure 6 moves closer to the base 8. Eventually, when the sanitizing block 2 is completely dissolved, the enclosure is supported entirely on the support member 3. In

this position, the base 8 of the enclosure 6 limits contact of the fragrance block 5 with liquid entering the housing. The enclosure 6 is formed from a non-soluble material, and as such does not dissolve or degrade due to liquid contact.

[0035] The enclosure 6 is configured such that it is larger in size than the apertures 28 in the support surface 3 across all aspects. As such, the enclosure 6 remains supported on the support surface 3 and is not able to pass through the apertures 28 into the waste trap. As the enclosure 6 is non-soluble, it never decreases in size and as such is never able to pass through the apertures 28. This ensures that as the fragrance block 5 supported in the enclosure 6 diminishes in size, it is prevented from falling through apertures 28, and therefore remains visible within the housing right up until it is completely dissolved. This is in contrast the to sanitizing block, which is unsupported by an enclosure and is able to fall through the apertures 28 in one or more pieces once it has dissolved sufficiently.

[0036] Once the enclosure 6 is empty, this is an indication to the maintenance staff or service engineer that the sanitizing block requires replacement.

[0037] As well as limiting the direct fluid contact from above, fluid flow into the housing through the support member 3 of the housing may also be controlled and limited. To achieve this, the support member 3 includes upper 30 and lower 32 members which are arranged and configured to permit relative movement, as shown in Figure 5. In a preferred embodiment, the upper member 30 is rotatably connected to the lower member 32, and is able to rotate relative to the lower member 32 which remains in a fixed position. Alternatively, the upper member 30 may remain fixed while the lower member 32 rotates relative thereto.

[0038] Movement of the upper member 5 relative to the lower member causes apertures 34 formed in the upper member to move into or out of alignment with the apertures 36 provided in the lower member.

[0039] The upper member 30 and lower member 32 are circular, disc shaped members, and are rotatably connected about a common central axis of rotation 38. The apertures 34 and 36 of the upper 30 and lower 32 members are arranged at corresponding angular positions around the upper 30 and lower 32 members and are preferably of corresponding size and shape. In a first open position the upper apertures 34 and 36 align such that the upper apertures 34 are fully open and unobstructed, allowing maximum fluid flow through the housing. In a second position, the upper member 30 is rotated such that the upper apertures 34 move out of complete alignment with the lower apertures 36. In this second position, occluding portions 40 of the lower member 32 which are positioned between the lower apertures 36, move into alignment with and partially occlude the upper apertures 34, thereby restricting the fluid flow therethrough.

[0040] Movement of the upper member 30 between the first open position and second closed position varies

the occlusion of the apertures 34, and hence the fluid flow therethrough, between fully open (unoccluded), intermediate (partially occluded) and closed (maximum occlusion) conditions. The open configuration, in which the upper apertures 34 and lower apertures 36 are fully or substantially aligned to create a continuous aperture continuing unobstructed through both the upper 30 and lower 32 members permits a maximum rate of flow through the device. The closed position, in which the occluding portions 40 are fully aligned with the apertures, minimizes the rate of flow.

[0041] When the upper 5 and lower 6 members are positioned such that each of their openings are fully aligned, apertures are formed through both the upper and lower members to permit maximum rate of flow of fluid through the waste outlet assembly 1. Superimposition of the upper member openings over the lower member openings results in the formation of apertures of maximum dimensions, said apertures perforating the device.

[0042] Upon relative re-positioning of the upper and/or lower members, the openings become misaligned. The openings of the upper member thus become partially occluded, decreasing the dimension of the aperture through the device and restricting the rate of flow of fluid through the device.

[0043] The slower the rate of flow through the assembly 1, the longer the block 2 is in contact with the fluid and, therefore, the faster it will dissolve. Conversely, the faster the passage of fluid through the assembly 1, the slower the dissolution of the block 2. Thus, the operator can control how long the block 2 will last by increasing or decreasing the rate at which it dissolves. The support device can thus be controlled to ensure the urinal block is able to last until replacement at the next service. Alternatively, the flow rate into the housing may be selected to ensure that the complete dissolution of the fragrance block 5 coincides with the expiry of the activity of the sanitizing block within the waste trap. As such, service intervals may be maximized through the combination of slower dissolution rate of the block 2 and/or fragrance block 5, and the presence of the fragrance block 5, retained by the enclosure, which acts as a visual and fragrant indicator of continuing functionality.

Claims

1. A sanitizing assembly for a urinal, the assembly comprising:

a first soluble sanitizing block comprising at least one of a disinfectant, deodorizing, bacterial and surfactant substance; and
a second fragrance block comprising a fragrant substance, wherein the second fragrance block is secured to the first sanitizing block.

2. A sanitizing assembly according to claim 1 wherein

the second fragrance block is supported and held on a support member formed from a non-soluble material, the support member being coupled to the first soluble block to secure the second fragrance block thereto.

3. A sanitizing assembly according to claim 2 wherein the support member is configured to support the second fragrance block within a urinal when the first soluble block has dissolved.

4. A sanitizing assembly according to claim 2 or 3 wherein the support member comprises an enclosure having a base and a plurality of walls extending upwardly from the base.

5. A sanitizing assembly according to claim 4 wherein the base comprises a solid planar member.

6. A sanitizing assembly according to claim 4 or 5 wherein the walls include a plurality of apertures.

7. A sanitizing assembly according to any one of claims 4 to 6 wherein the plurality of walls each comprise a plurality of castellations.

8. A sanitizing assembly according to any one of claims 4 to 7 wherein the enclosure defines a cage for housing the fragrance block.

9. A sanitizing assembly according to any one of claims 4 to 8 wherein the enclosure includes at least one open portion configured such that the fragrance is externally visible and to permit fragrance release therefrom.

10. A sanitizing assembly according to any preceding claim, wherein the support member comprises at least one connection member for securing the support member to the sanitizing block.

11. A sanitizing assembly according to claim 10 wherein the at least one connection member comprises at least one tapered projection defining a securing spike configured to be inserted into the sanitizing block to secure the support member thereto.

12. A toilet sanitizing device comprising:

a sanitizing assembly according to any preceding claim;
an enclosure for housing the sanitizing assembly, the enclosure comprising a cover section and a base having at least one aperture formed therein, wherein the support member and the at least one aperture are configured such that the support member is supported on and unable to pass through the at least one aperture to retain

the support member within the housing.

13. A toilet sanitizing device according to claim 12, wherein the housing comprises attachment means for coupling the housing to a waste outlet of a urinal. 5

14. A support assembly for a urinal fragrance block comprising:

a base and a plurality of walls defining an enclosure for a fragrance block, the enclosure having at least one open portion configured to permit the release of fragrance from the block, and at least one securing member configured for securing the support member to a urinal sanitizing block. 10 15

15. A support assembly according to claim 14 wherein the at least one connection member comprises at least one tapered projection defining a securing spike configured to be inserted into the sanitizing block to secure the support member thereto. 20

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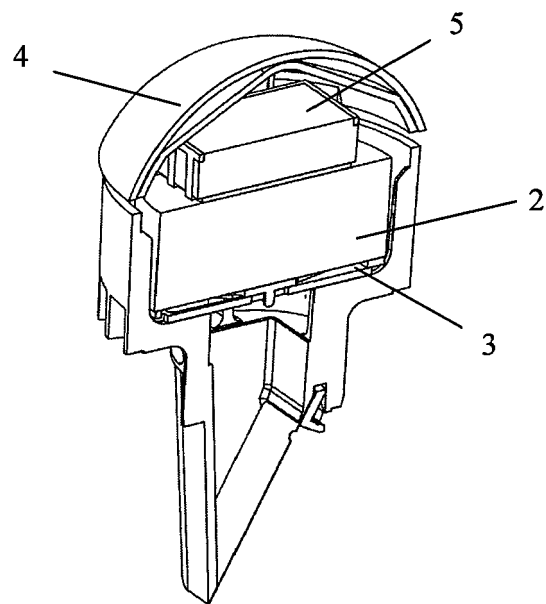


Fig 1

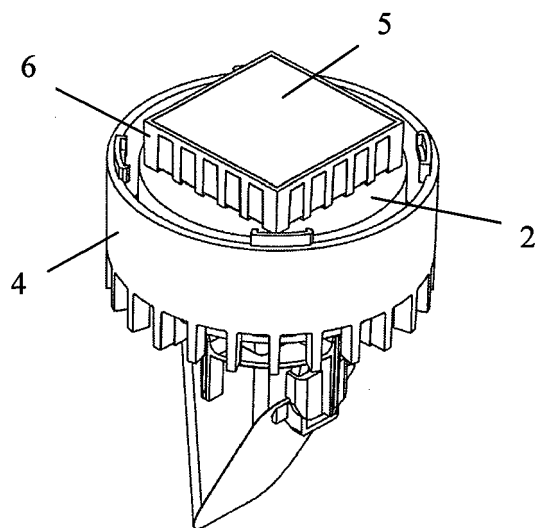


Fig 2

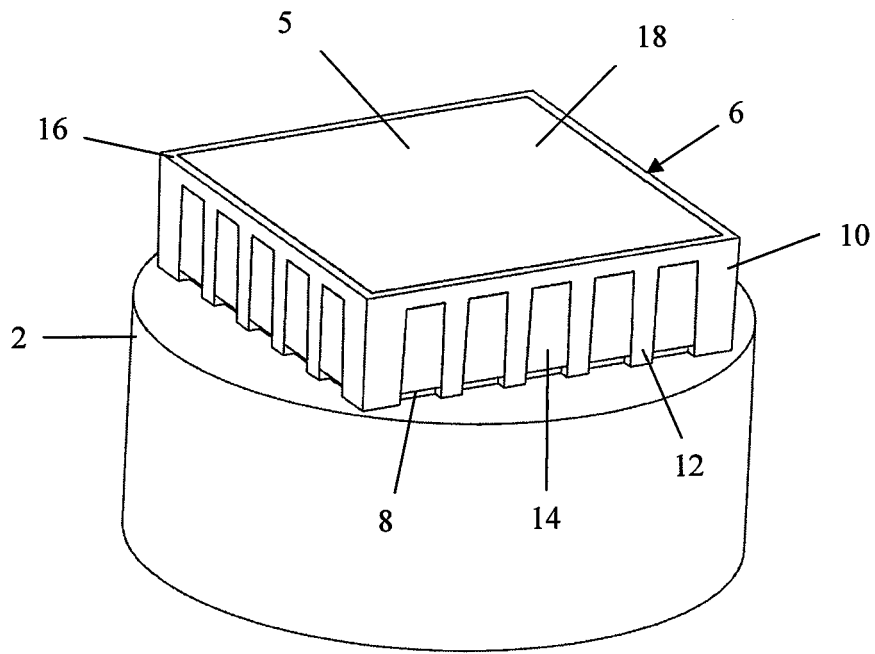


Fig 3

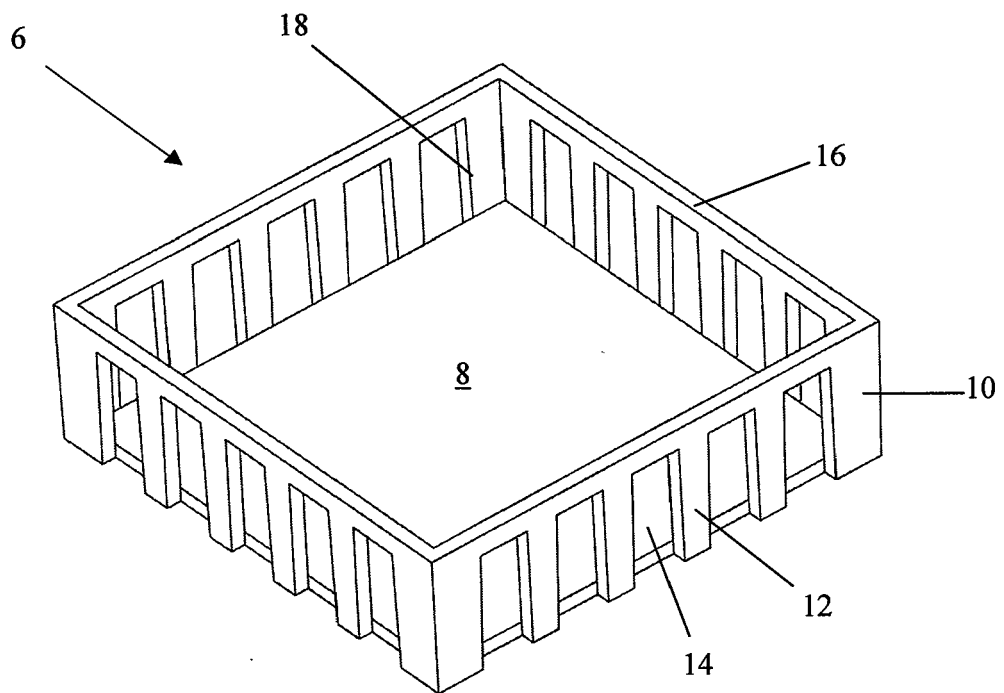


Fig 4

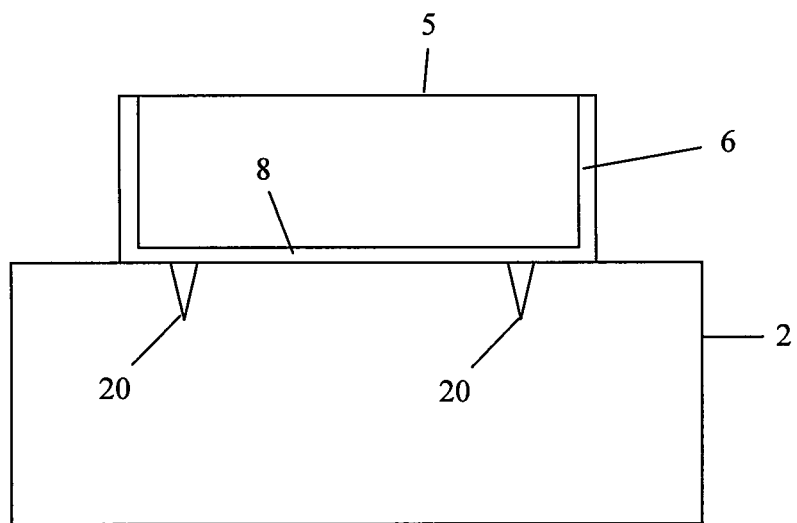


Fig 5

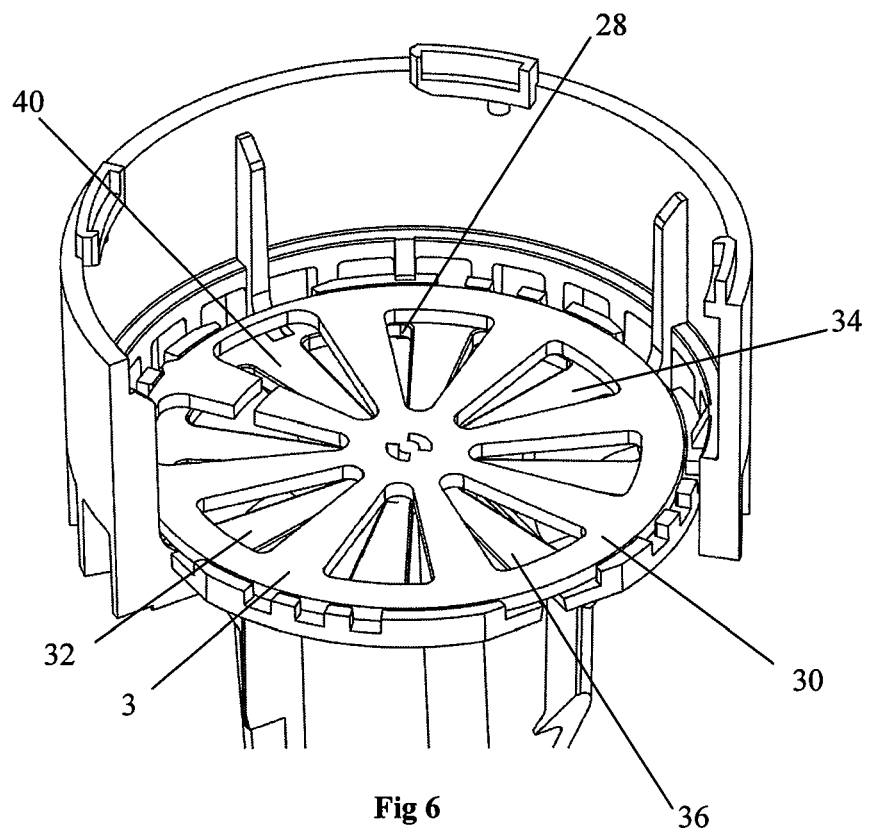


Fig 6