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(54) **URINAL SCREEN**

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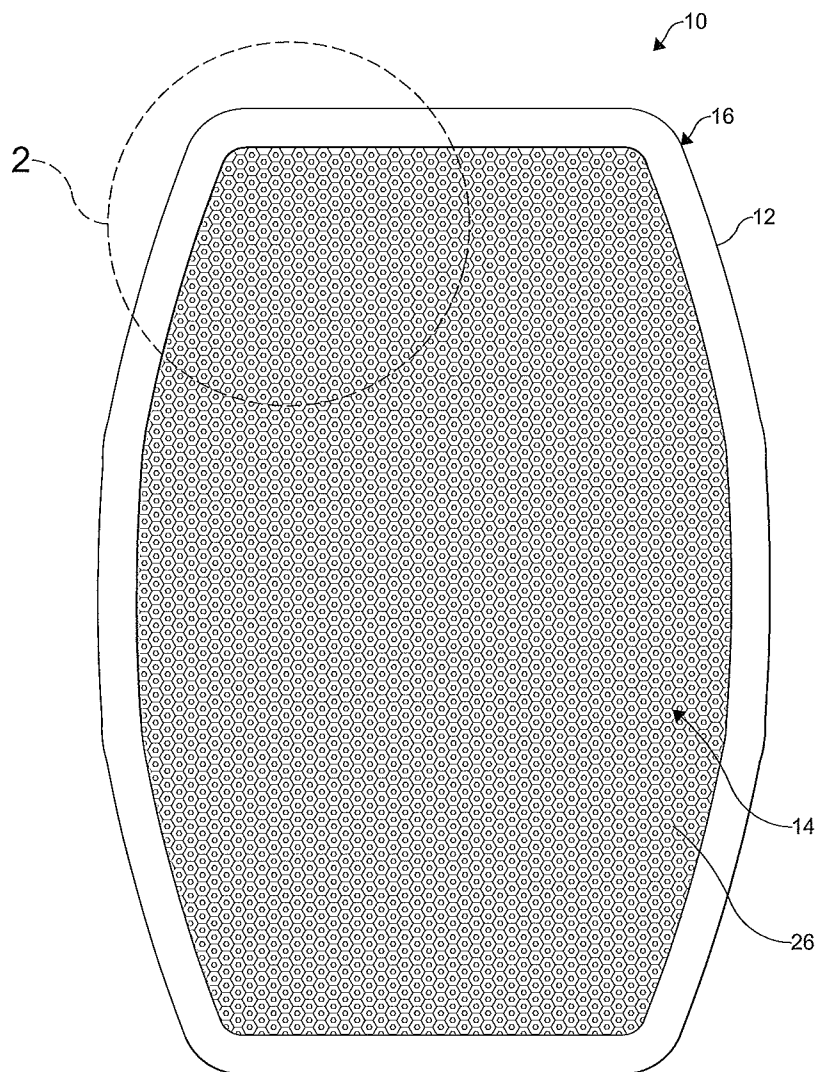
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(60) Provisional application No. 61/700,926, filed on Sep. 14, 2012.

(57) **ABSTRACT**

A urinal screen including a body having a plurality of openings formed therein and a frame disposed around at least a portion of the body, the frame having a substantially concave shape. The urinal screen is adapted to be positioned in a substantially upright position in the urinal with a first end of the urinal screen adjacent a bottom of the urinal and a second end of the urinal screen adjacent a rear surface of the urinal,



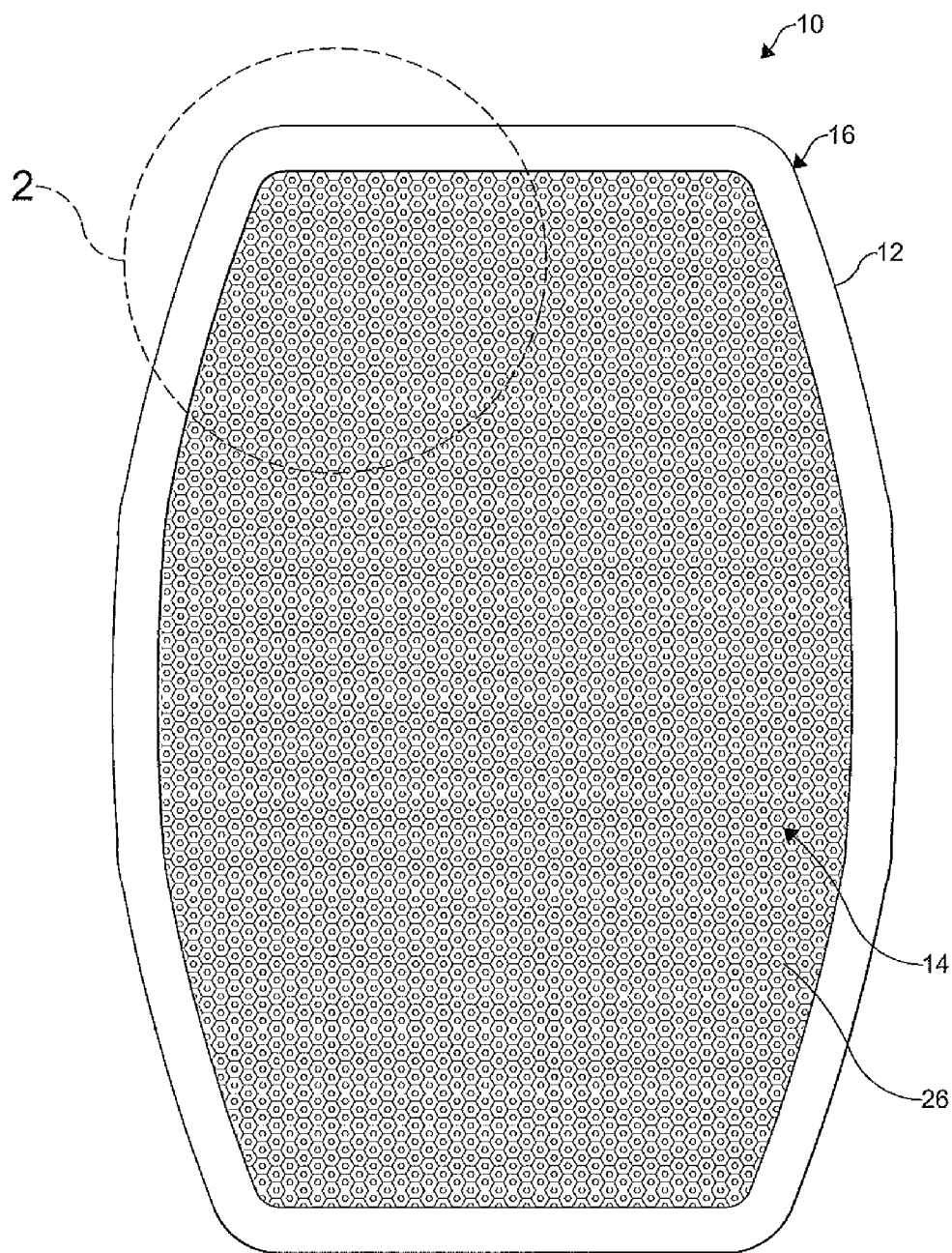


FIG. 1

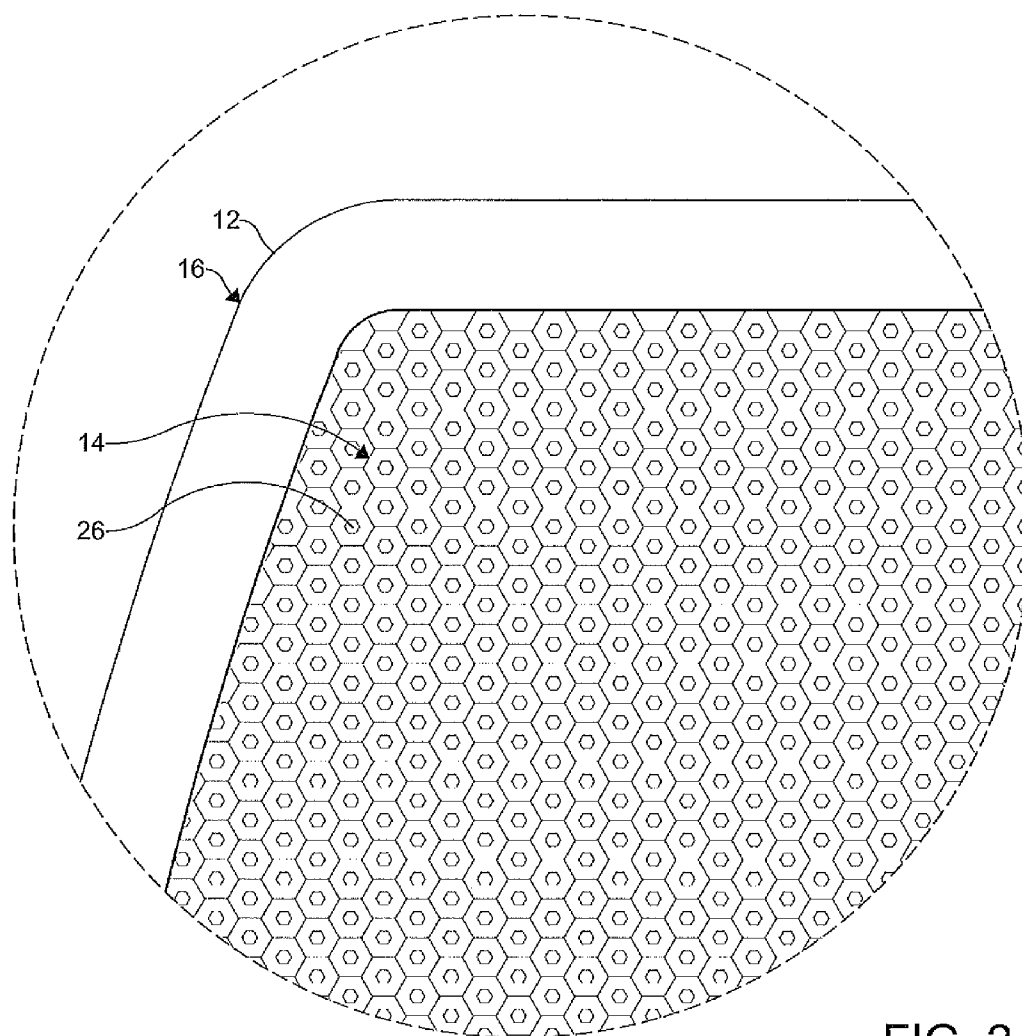


FIG. 2

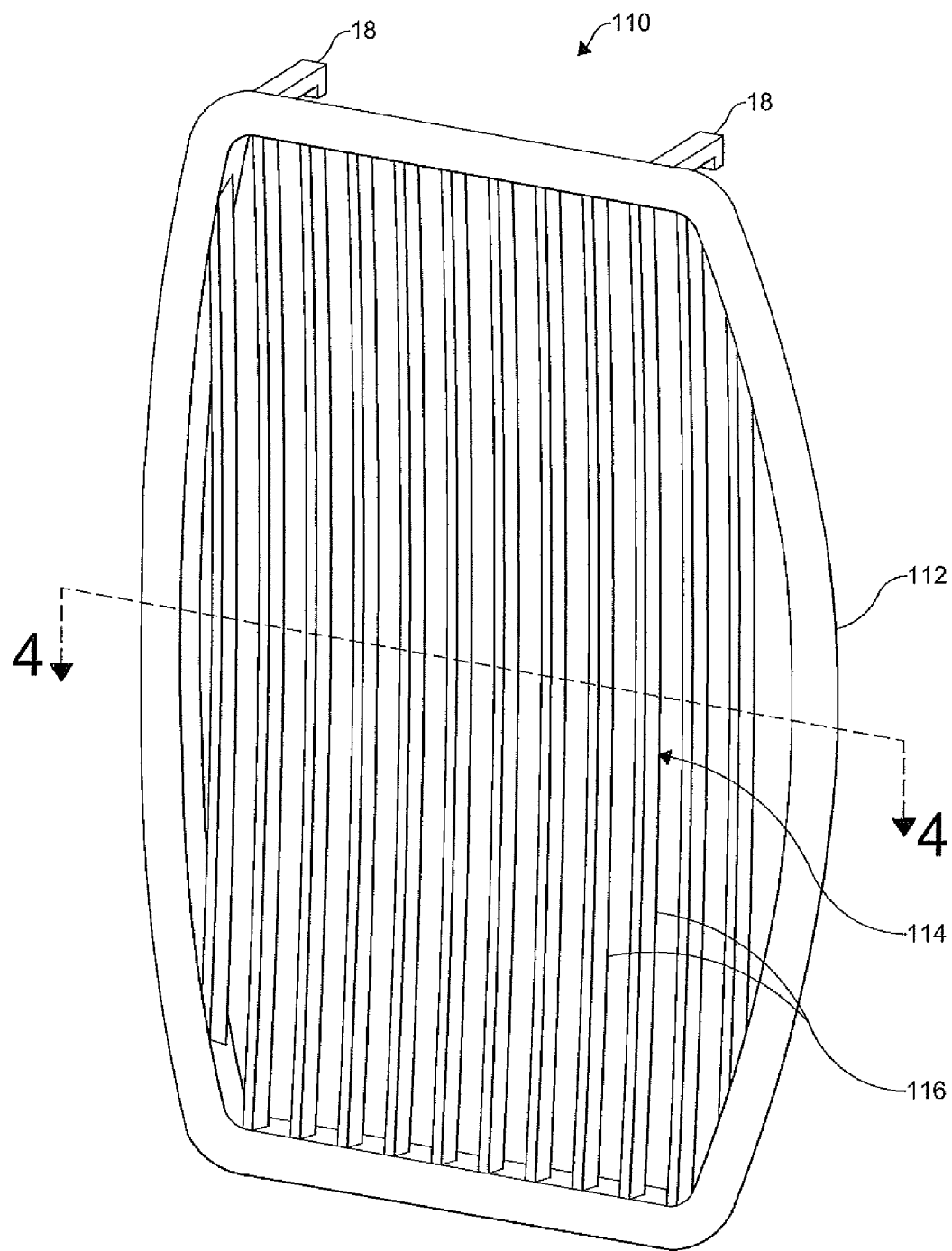


FIG. 3

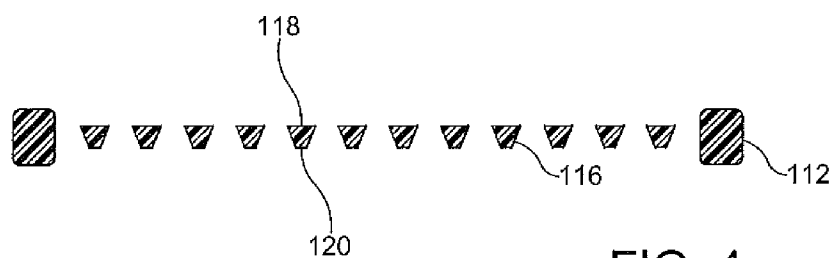


FIG. 4

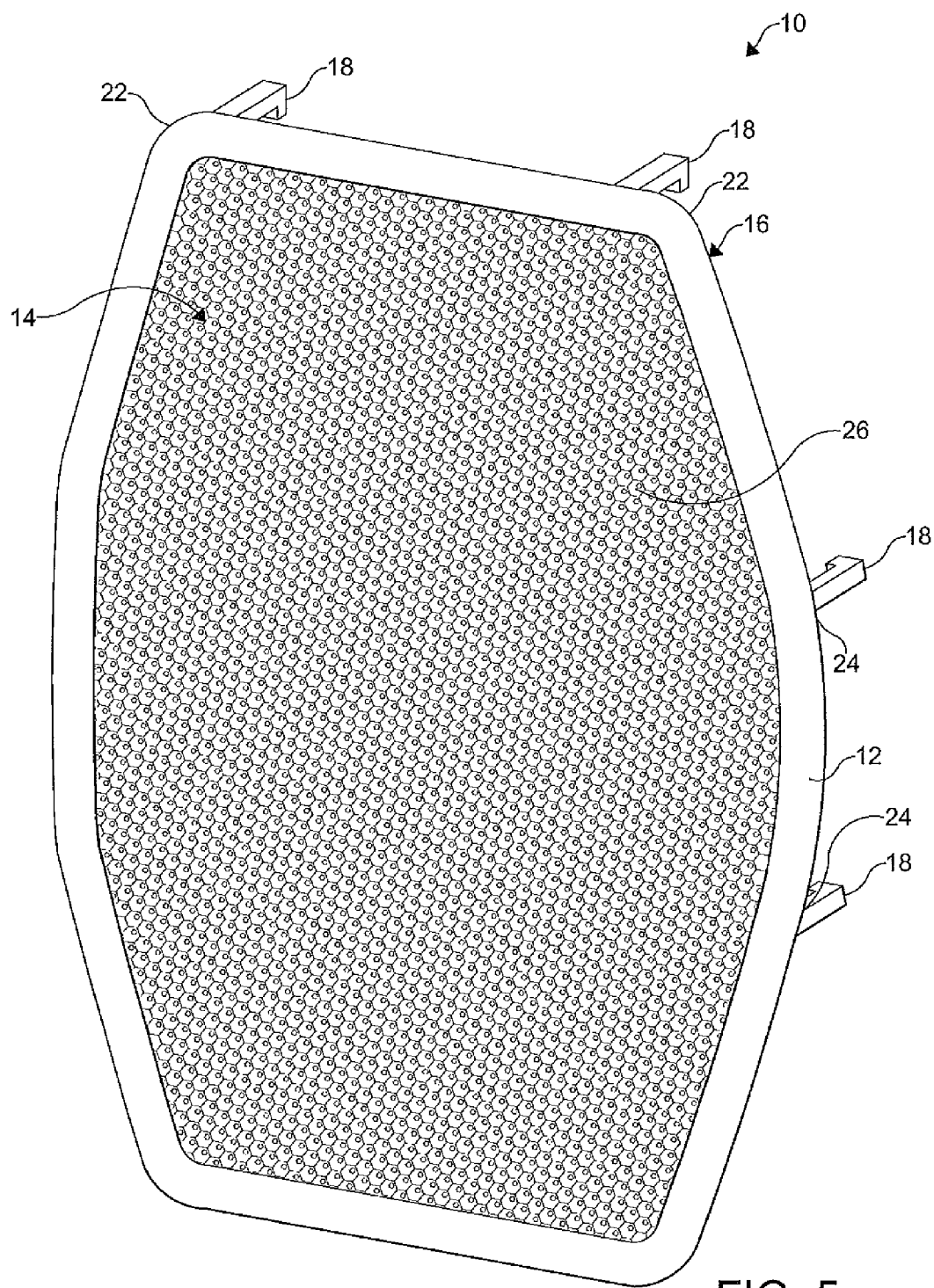


FIG. 5

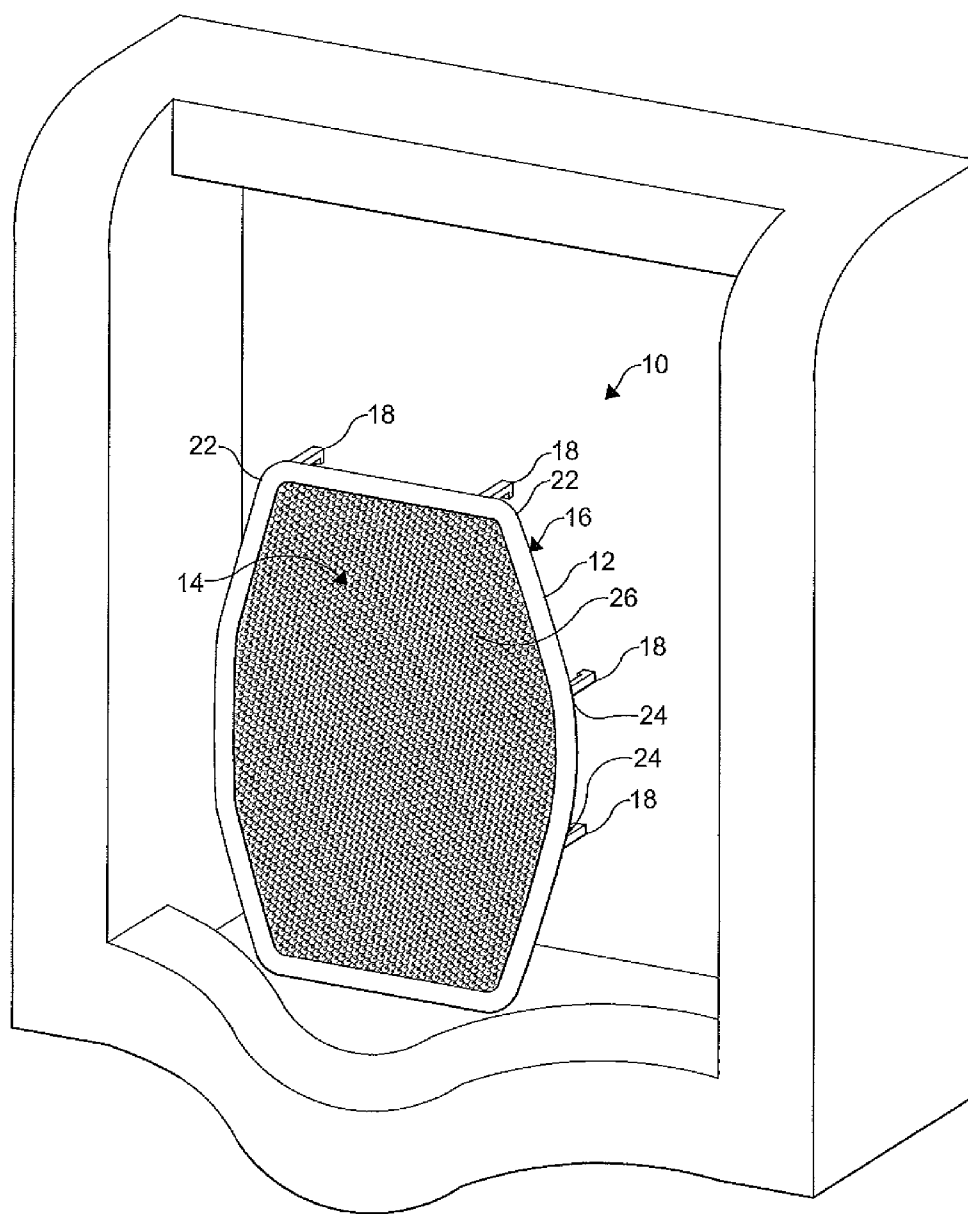


FIG. 6

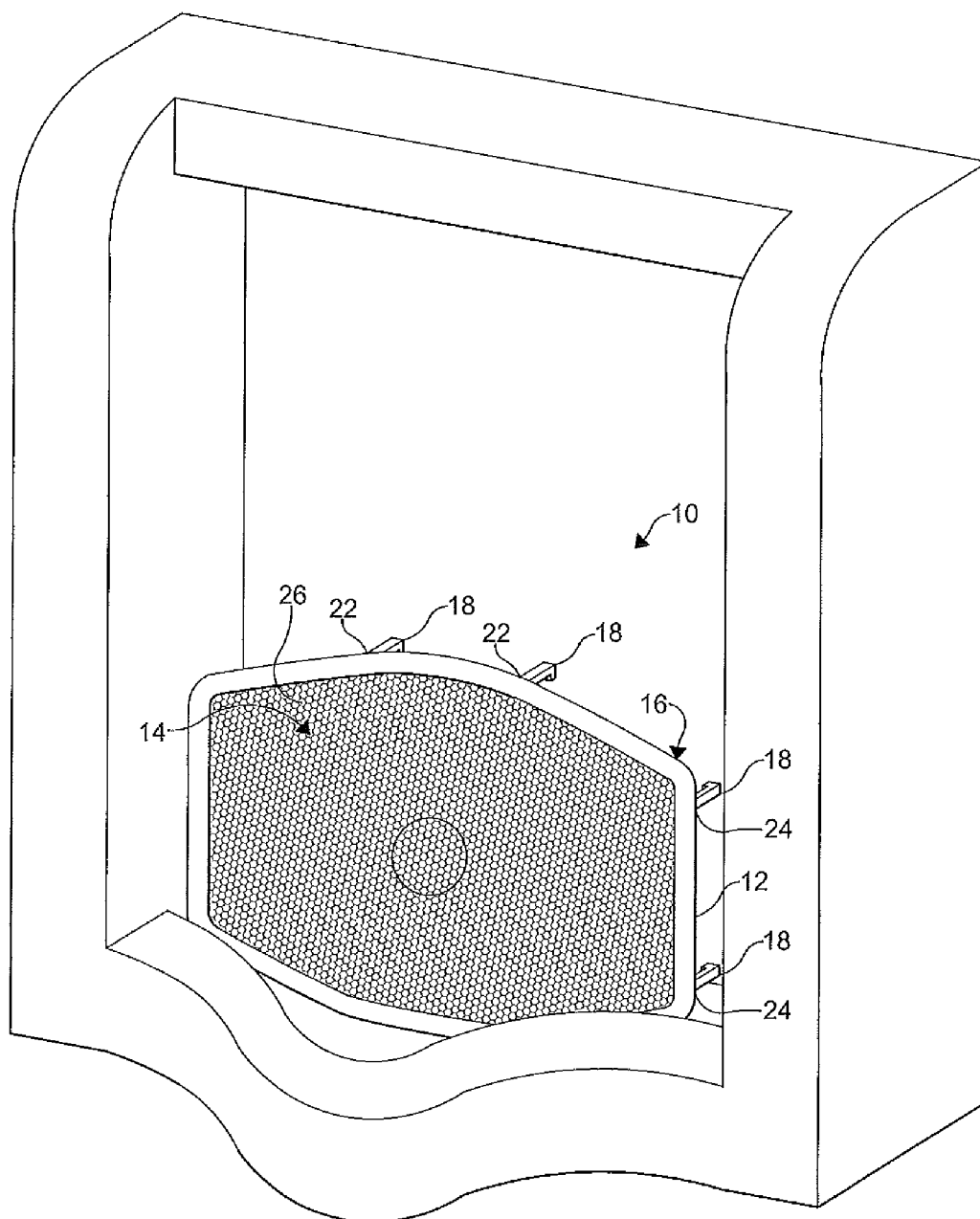


FIG. 7

URINAL SCREEN

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority to U.S. Provisional Patent Application Ser. No. 61/700,926, filed Sep. 14, 2012, the entire disclosure of which is hereby incorporated herein by reference.

FIELD OF THE INVENTION

[0002] The present disclosure relates to a urinal screen, and more specifically to a urinal screen used to minimize urine and water back-splash resulting from use of a urinal,

BACKGROUND OF THE INVENTION

[0003] A urinal often includes a urinal screen to perform various functions. First, the urinal screen may be used to receive and direct a user's stream of urine into a drain of the urinal. The urinal screen may also prevent debris from entering and clogging the waste drain of the urinal. Furthermore, the urinal screen may provide a means for deodorizing or scenting an area surrounding the urinal. For example, the urinal screen may hold a block of deodorant for freshening and sanitizing the urinal between uses, or the urinal screen may be formed by a fragranting material, such as the material described in U.S. Provisional Application Ser. No. 61/700,926. Finally, the urinal screen may hide a collection of urine that has not drained from the urinal.

[0004] One particular problem that occurs when using the urinal is that there is typically a significant amount of urine back-splash that occurs when the user's urine stream makes contact with either the urinal or the urinal screen. Many urinal screens have been constructed to address this problem, however, those urinal screens are often not very effective at minimizing the urine back-splash. As a result, the user may end up with urine and/or toilet water on his skin or clothing, and the floor area around the urinal may quickly become slippery, soiled, and unsanitary.

[0005] It is desirable to have a urinal screen that militates against a urine back-splash, is effective at deodorizing the urinal and surrounding area, and that fits securely into various urinals having different shapes and sizes.

SUMMARY OF THE INVENTION

[0006] Consonant with the present disclosure, a urinal screen that militates against a urine back-splash, is effective at deodorizing the urinal and surrounding area, and that fits securely into various urinals having different shapes and sizes, has surprisingly been discovered.

[0007] In one embodiment of the disclosure, a urinal screen including a body having a plurality of openings and a frame disposed around at least a portion of the body, the frame having a substantially concave shape, is disclosed. The urinal screen is configured to be positioned in a substantially upright position in a urinal with a first end of the urinal screen positioned adjacent a bottom of the urinal and a second end of the urinal screen positioned adjacent a rear surface of the urinal.

[0008] In another embodiment of the disclosure, a urinal screen including a body formed from a polyester mesh material, a frame disposed around at least a portion of the body, the frame having a substantially concave shape, and at least one support structure adapted to space the urinal screen outwardly from the a rear surface of a urinal is described. The urinal

screen is configured to be positioned in a substantially upright position in the urinal with a first end of the urinal screen positioned adjacent a bottom of the urinal and a second end of the urinal screen positioned adjacent a rear surface of the urinal.

[0009] In yet another embodiment of the disclosure, a urinal screen including a body including a plurality of screening elements, a frame disposed around at least a portion of the body, the frame having a substantially concave shape, and at least one support structure adapted to space the urinal screen outwardly from a rear surface of a urinal is disclosed. The urinal screen is configured to be positioned in a substantially upright position in the urinal with a first end of the urinal screen positioned adjacent a bottom of the urinal and a second end of the urinal screen positioned adjacent the rear surface of the urinal.

DRAWINGS

[0010] The above, as well as other advantages of the present disclosure, will become readily apparent to those skilled in the art from the following detailed description, particularly when considered in the light of the drawings described hereafter.

[0011] FIG. 1 shows a front elevational view of a urinal screen according to one embodiment of the present disclosure;

[0012] FIG. 2 shows an enlarged fragmentary front elevational view of the urinal screen depicted in FIG. 1 within circle 2;

[0013] FIG. 3 shows a front perspective view of a urinal screen according to another embodiment of the present disclosure;

[0014] FIG. 4 shows a cross-sectional view of the urinal screen taken along line 4-4 in FIG. 3;

[0015] FIG. 5 shows a front perspective view of the urinal screen of FIG. 1;

[0016] FIG. 6 shows a front perspective view of the urinal screen of FIG. 1 disposed in a urinal in a first position; and

[0017] FIG. 7 shows a front perspective view of the urinal screen of FIG. 1 disposed in a urinal in a second position.

DETAILED DESCRIPTION OF THE INVENTION

[0018] The following detailed description and appended drawings describe and illustrate various exemplary embodiments of the invention. The description and drawings serve to enable one skilled in the art to make and use the invention, and are not intended to limit the present disclosure, application, or uses.

[0019] FIGS. 1-2 illustrate a urinal screen 10 according to one embodiment of the disclosure. The urinal screen 10 includes a frame 12 and a body 14. The urinal screen 10 is configured to be placed in a urinal to militate against a back-splash from a stream of urine from a user.

[0020] The frame 12 is produced from a material such as plastic, metal, or rubber, for example, and may be hollow or solid. The material is typically a substantially rigid material but in certain embodiments the frame 12 may have a degree of flexibility. The frame 12 has a substantially rectangular shape in certain embodiments of the disclosure, as shown in FIGS. 1 and 5-7. However, any shape may be used such as an oval shape, for example, or the frame 12 may be asymmetrical. The frame 12 may have an arcuate or substantially concave shape, as shown in FIG. 5, or may be planar. The generally

concave shape may be characterized as one or more of a segment of a sphere, a segment of an ellipsoid, a segment of an oblate spheroid, a segment of a prolate spheroid, an elliptic or hyperbolic paraboloid, a parabolic cylinder, a hyperbolic cylinder, and a lune, for example. In certain embodiments where the frame 12 includes one or more corners 16, each corner 16 may have a rounded or arcuate shape or may have a squared corner. A cross-section of the frame 12 may be any shape such as cylindrical, rectangular, or asymmetrical, for example. The cross-section of the frame 12 may also have a consistent or a variable thickness. The frame 12 is adapted to be disposed in the urinal in a substantially upright position. The frame 12 may also include one or more internal frame components or cross members (not shown) such as one or more frame elements extending across the body 14 from one end of the frame to another end of the frame, for example.

[0021] One or more support structures or legs 18 may be disposed on one or more portions of the frame 12, as shown in FIG. 5. Each of the support structures 18 typically extends laterally outwardly from a back side of the frame 12 and is configured to contact the urinal when in use. For example, as shown in FIG. 5, each of the support structures 18 may be disposed adjacent one or more of the corners 16 of the frame 12. The support structures 18 may be disposed adjacent a pair of upper corners 22 and/or a pair of side corners 24 in certain embodiments in order to accommodate urinals having different shapes and configurations (see FIGS. 6 and 7). In certain embodiments, each of the support structures 18 has a length of about 0.25 inches in order to space the urinal screen 10 outwardly from the urinal. The length of each of the support structures 18 may be greater than or less than 0.25 inches, as desired. A thickness, a cross-sectional shape, and an overall shape of each of the support structures 18 may vary according to different embodiments. Each of the support structures 18 may be permanently or removeably connected to the frame 12, or may be formed integral with the frame 12.

[0022] The body 14 is formed in a latticework or mesh configuration in certain embodiments, as shown in FIGS. 1 and 2. The body 14 may be produced from any mesh material such as polyester or other fabric, or may be made from a material such as metal, plastic, or rubber, for example. Typically, the body 14 produced from a mesh material has a degree of elasticity and flexibility capable of absorbing at least a portion of a force or energy exerted by the stream of urine from the user.

[0023] A plurality of openings 26 may be formed in the body 14. In certain embodiments, each opening 26 has a hexagonal shape. It is understood that other shapes may be used, as desired. In certain embodiments, a width of each opening is about 0.5 millimeters. The width may be less than or greater than 0.5 millimeters, however, favorable results have been obtained when the opening is less than 1.0 millimeter. In certain embodiments, each opening 26 has a first width at a first end that is greater than a second width and a second end opposite the first end. An intermediate width of each opening 26 gradually decreases from the first width to the second width and, as a result, each opening 26 is narrower toward a back of the body 14 and less narrow toward a front of the body 14. The first width that is greater than the second width allows for the stream of urine from the user to be effectively diffused.

[0024] The body 14 is shaped to be received within the frame 12. As shown, the body 14 has an arcuate or substantially concave shape like the frame 12, or may be planar. The

substantially concave shape may be characterized as one or more of a segment of a sphere, a segment of an ellipsoid, a segment of an oblate spheroid, a segment of a prolate spheroid, an elliptic or hyperbolic paraboloid, a parabolic cylinder, a hyperbolic cylinder, and a lune, for example, in certain embodiments. A permanent or removable connection between the frame 12 and the body 14 may extend along an inner or an outer perimeter of the frame 12. The connection may be formed by either a chemical type fastener such as an adhesive, for example, and/or a mechanical type fastener. Alternatively, the body 14 may have one or more portions that are permanently or removeably connected to the frame 12 at one or more locations and one or more portions that are not connected to the frame 12. In certain embodiments, the body 14 may be formed integral with the frame 12.

[0025] Another embodiment 110 of a urinal screen is illustrated in FIGS. 3 and 4. The urinal screen 110 includes a frame 112 substantially similar to the frame 12 as described hereinabove, and a main body 114. The main body 114 includes a plurality of spaced apart screening elements 116 such as slats, louvers, ribs, or rods, for example. The screening elements 116 may be vertically oriented as shown or otherwise oriented such as horizontally and/or diagonally, for example. Additionally, the screening elements 116 may be formed in a latticework configuration in certain embodiments. The screening elements 116 may be made from a material such as polyester, plastic, certain metals, or rubber, for example. The screening elements 116 made from a polyester material or the like may have a degree of elasticity capable of absorbing at least a portion of the force or energy exerted by the stream of urine from the user. A cross-sectional shape of the screening elements 116 may be any shape such as circular, rectangular, square, triangular, or asymmetrical, for example. In certain embodiments, a first surface 118 of each absorbing element 116 facing away from the user has a first width that is greater than a second width of a second surface of each screening element 116 facing towards the user, as shown in FIG. 4. Having the first width facing away from the user greater than the second width facing towards the user militates against back-splash by diffusing the stream of urine from the user as the stream contacts the urinal screen 110.

[0026] As shown, the screening elements 116 have a curved shape like the frame 112, or may be planar in certain embodiments. A permanent or removable connection between the frame 112 and at least a portion of each screening element 116 may extend along an inner or an outer perimeter of the frame 112. The connection may be formed by either a chemical type fastener such as an adhesive, for example, and/or a mechanical type fastener. In certain embodiments, each screening element 116 may be formed integral with the frame 112.

[0027] In use, a user places the urinal screen 10 in the urinal. The position of the urinal screen 10 causes the urine stream of the user to contact the urinal screen 10 prior to contacting the urinal. The support structures 18 located along two or more sides of the urinal screen 10 allow the urinal screen 10 to be set up in accordance with a specific shape and size of the selected urinal. Additionally, the support structures 18 space the urinal screen 10 outwardly away from a surface of the urinal, thereby allowing flush water from the urinal to run down a back of the urinal without contacting the urinal screen 10 and splashing the user.

[0028] The substantially curved shape of the frame 12 and the body 14 militates against back splash of urine when the urinal screen 10 is in use. Additionally, the parabolic shape

allows an unsightly bottom portion of the urinal to be covered, and allows the urinal screen 10 to function as a screen to prevent debris from clogging a urinal drain. The frame 12 provides support for the body 14 and facilitates maintaining an elasticity or springability of the body 14 in order to facilitate absorbing the force exerted by the urine stream from the user. The hexagonal shape of the openings and the decreasing intermediate width of each opening also militate against the back-splash of urine and direct the urine stream into the urinal. Likewise, in the alternative embodiment shown in FIGS. 3 and 4, the increasing width of the absorbing elements 116 militates against the back-splash of urine and directs the urine stream into the urinal.

[0029] The urinal screen 10 may be easily cleaned by spraying the frame 12 and the body 14 with a disinfectant. The user may replace the urinal screen 10, as desired.

[0030] A design, logo, advertisement, or other print may be included on either the frame 12 or the body 14. A design such as a target, for example, as shown in FIG. 7, may be included on the body 14 in order to assist the user in aiming the stream of urine to an area of the urinal screen 10 most effective at militating against urine back-splash.

[0031] The urinal screen 10 described hereinabove has several advantages. First, the various support structures 18 allow the versatile urinal screen 10 to be positioned in various ways depending on the size and shape of the selected urinal, and prevent the user from coming in contact with flush water back-splash when the urinal is flushed by the user. Additionally, the shape and curvature of the frame 12 and the body 14, and the shape and size of the openings 26 or absorbing elements 116 also militate against the urine back-splash by diffusing and directing the stream of urine into the urinal. Furthermore, in embodiments where a mesh material is used, the elasticity and flexibility of the mesh material absorbs at least a portion of the force or energy exerted by the stream of urine from the user. Overall, this creates a restroom environment that is more sanitary and more aesthetically pleasing, and it keeps the user free from flush water and urine back-splash.

[0032] While certain representative embodiments and details have been shown for purposes of illustrating the invention, it will be apparent to those skilled in the art that various changes may be made without departing from the scope of the disclosure, which is further described in the following appended claims.

What is claimed is:

1. A urinal screen, comprising:
a body including a plurality of openings; and
a frame disposed around at least a portion of the body, the frame having a substantially concave shape;
wherein the urinal screen is configured to be positioned in a substantially upright position in a urinal with a first end of the urinal screen positioned adjacent a bottom of the urinal and a second end of the urinal screen positioned adjacent a rear surface of the urinal.
2. The urinal screen of claim 1, wherein the body is produced from at least one of polyester, plastic, and rubber and is formed in a latticework configuration.
3. The urinal screen of claim 1, wherein the body has a substantially parabolic cylinder shape.
4. The urinal screen of claim 1, wherein each opening is hexagonal in shape.
5. The urinal screen of claim 1, wherein each opening has a maximum width of between about 0.5 and 1.0 millimeters.

6. The urinal screen of claim 1, wherein each opening has a first width adjacent a front side of the body that is greater than a second width adjacent a back side of the body.

7. The urinal screen of claim 6, wherein the urinal screen includes at least one support structure adapted to space the urinal screen outwardly from the rear surface of the urinal.

8. The urinal screen of claim 7, wherein the at least one support structure is about 0.25 inches long.

9. A urinal screen, comprising:

- a body formed from a polyester mesh material;
 - a frame disposed around at least a portion of the body, the frame having a substantially concave shape; and
 - at least one support structure adapted to space the urinal screen outwardly from a rear surface of a urinal;
- wherein the urinal screen is configured to be positioned in a substantially upright position in the urinal with a first end of the urinal screen positioned adjacent a bottom of the urinal and a second end of the urinal screen positioned adjacent a rear surface of the urinal.

10. The urinal screen of claim 9, wherein openings formed in the mesh material have a hexagonal shape.

11. The urinal screen of claim 10, wherein each of the openings has a maximum width of between about 0.5 and 1.0 millimeters.

12. The urinal screen of claim 10, wherein each of the openings has a first width adjacent a front side of the body that is greater than a second width adjacent a back side of the body, and an intermediate width that decreases from the first width to the second width, and wherein each of the openings diffuse a stream of urine from a user.

13. The urinal screen of claim 9, wherein the polyester mesh material has an elasticity that absorbs a force exerted by a stream of urine from a user.

14. The urinal screen of claim 9, wherein the at least one support structure is about 0.25 inches long.

15. A urinal screen, comprising:

- a body including a plurality of screening elements;
 - a frame disposed around at least a portion of the body, the frame having a substantially concave shape; and
 - at least one support structure adapted to space the urinal screen outwardly from a rear surface of a urinal;
- wherein the urinal screen is configured to be positioned in a substantially upright position in the urinal with a first end of the urinal screen positioned adjacent a bottom of the urinal and a second end of the urinal screen positioned adjacent the rear surface of the urinal.

16. The urinal screen of claim 15, wherein each of the screening elements has a substantially concave shape.

17. The urinal screen of claim 15, wherein each of the screening elements is one of a vertical slat, a louver, a rib, or a rod.

18. The urinal screen of claim 15, wherein each of the screening elements is made from one of polyester, plastic, and rubber.

19. The urinal screen of claim 15, wherein each of the screening elements has a first width adjacent a front of the screening element that is less than a second width adjacent a back side of the screening element, and an intermediate width that increases from the first width to the second width.

20. The urinal screen of claim 15, wherein the at least one support structure is about 0.25 inches long.

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