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(54) **SELF-SEALING CLOSET FLANGE**

(52) **U.S. Cl.**

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(57) **ABSTRACT**

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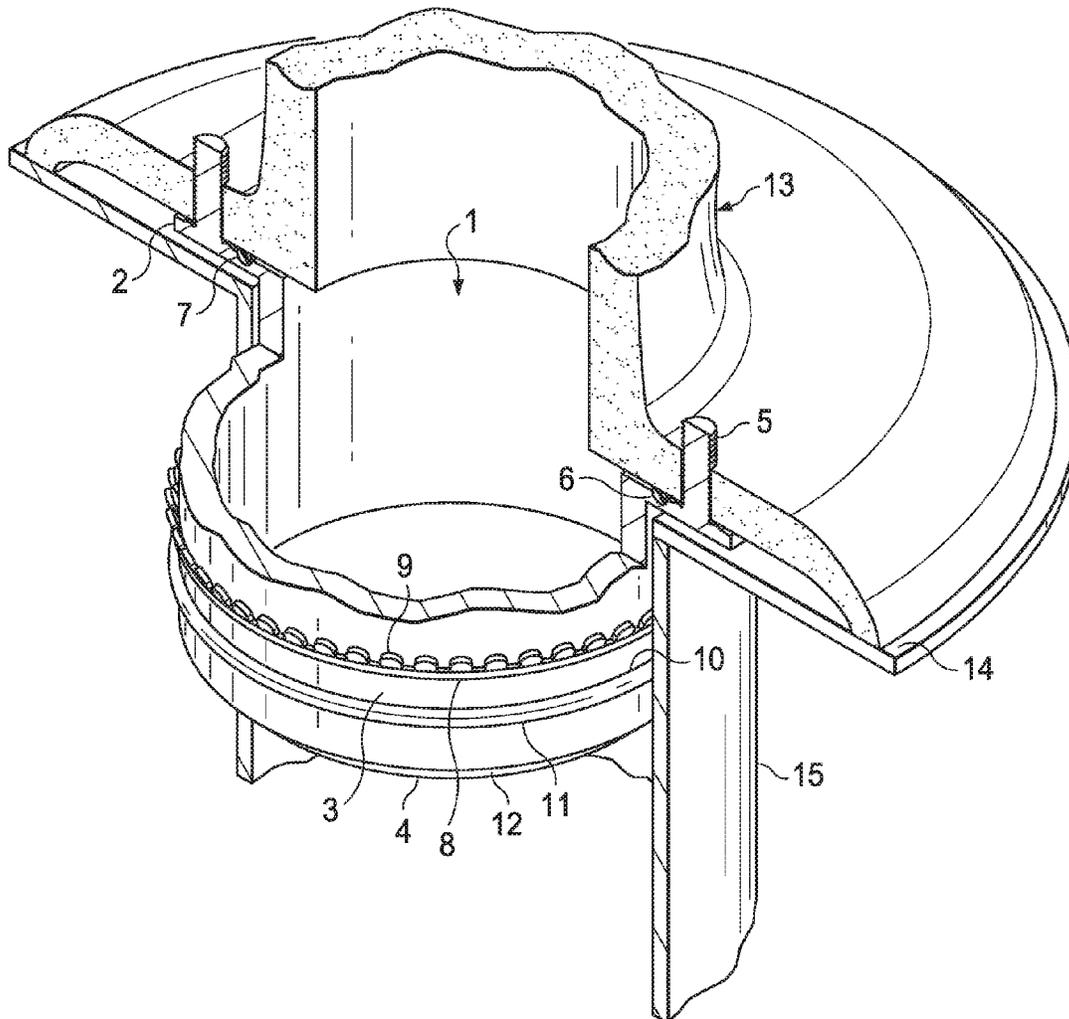
A closet flange system with attached bolts on the anterior surface and a beveled edge on the posterior surface, a groove on the anterior surface for an O-ring to form a seal between the bottom of the toilet and the anterior edge of the closet flange. The anterior surface is connected to a midsection of the closet flange, which includes a keeper ring, securing the position of the closet flange within a drain pipe by preventing removal. An additional O-ring may be positioned on the midsection to block fluid and gas from the drain from rising to contact the keeper ring or escaping outside of the drain pipe. The beveled edge guides the end of the flange into the drain pipe. The system includes bolts which attach the closet flange to the bottom of the toilet before the system is attached to the drain pipe at the floor surface.

Related U.S. Application Data

(63) Continuation of application No. 13/930,461, filed on Jun. 28, 2013, now abandoned.

Publication Classification

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E03D 11/16 (2006.01)



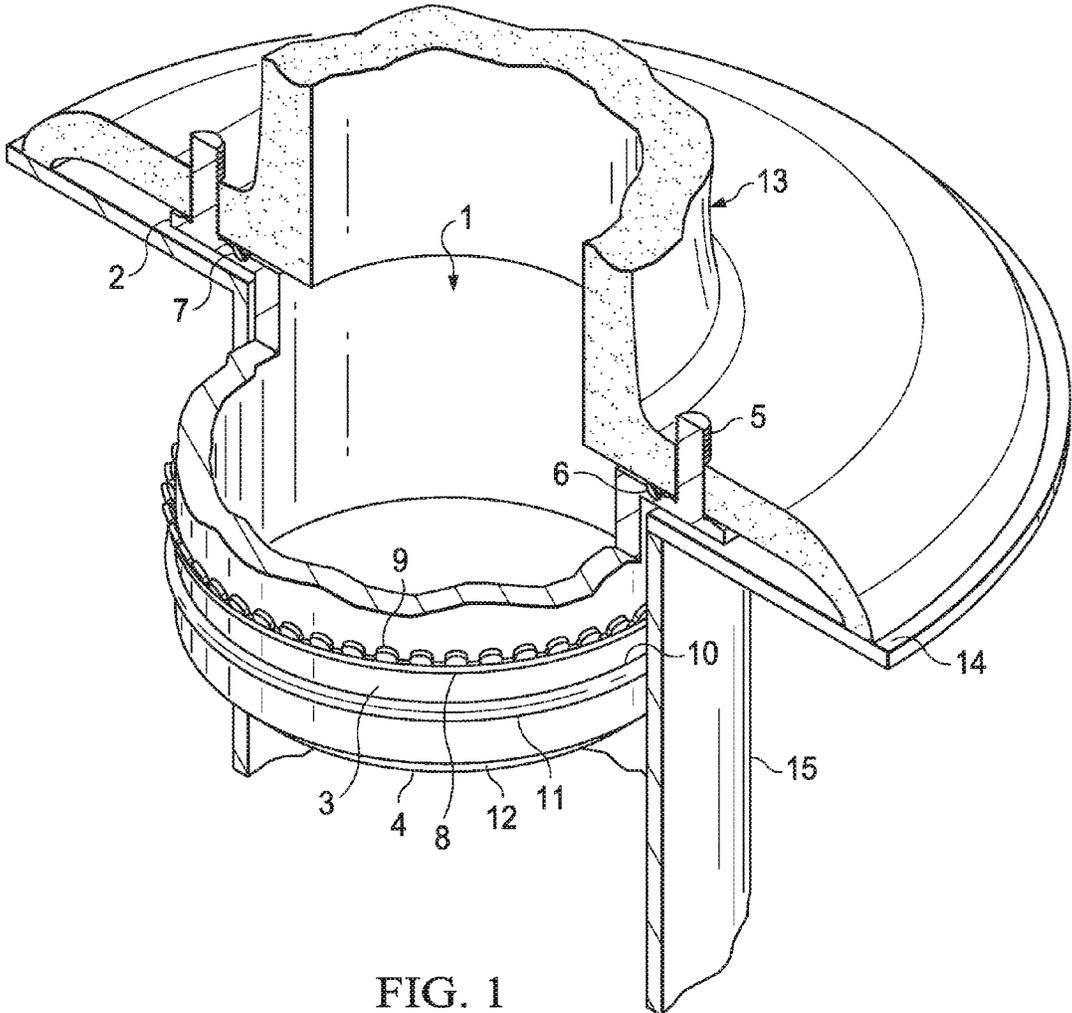


FIG. 1

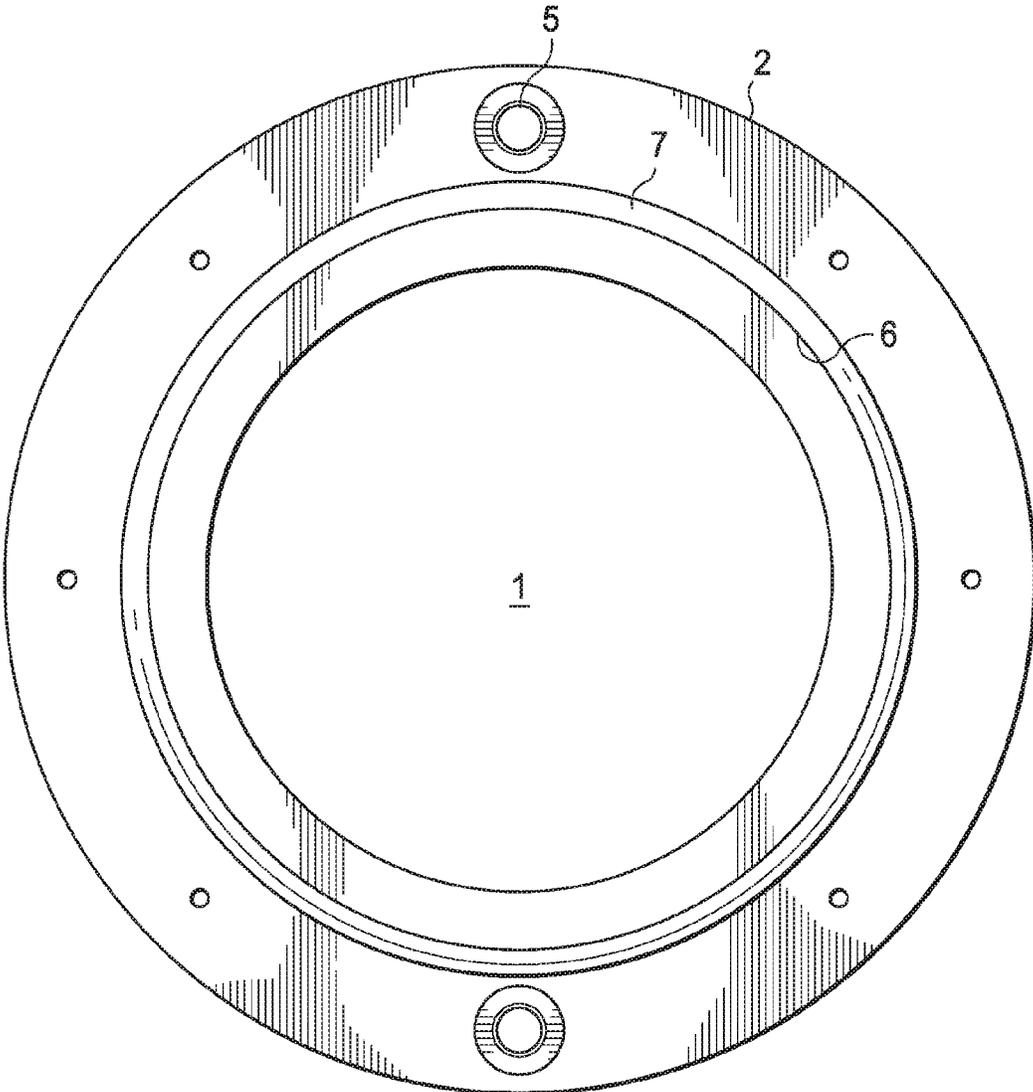


FIG. 2

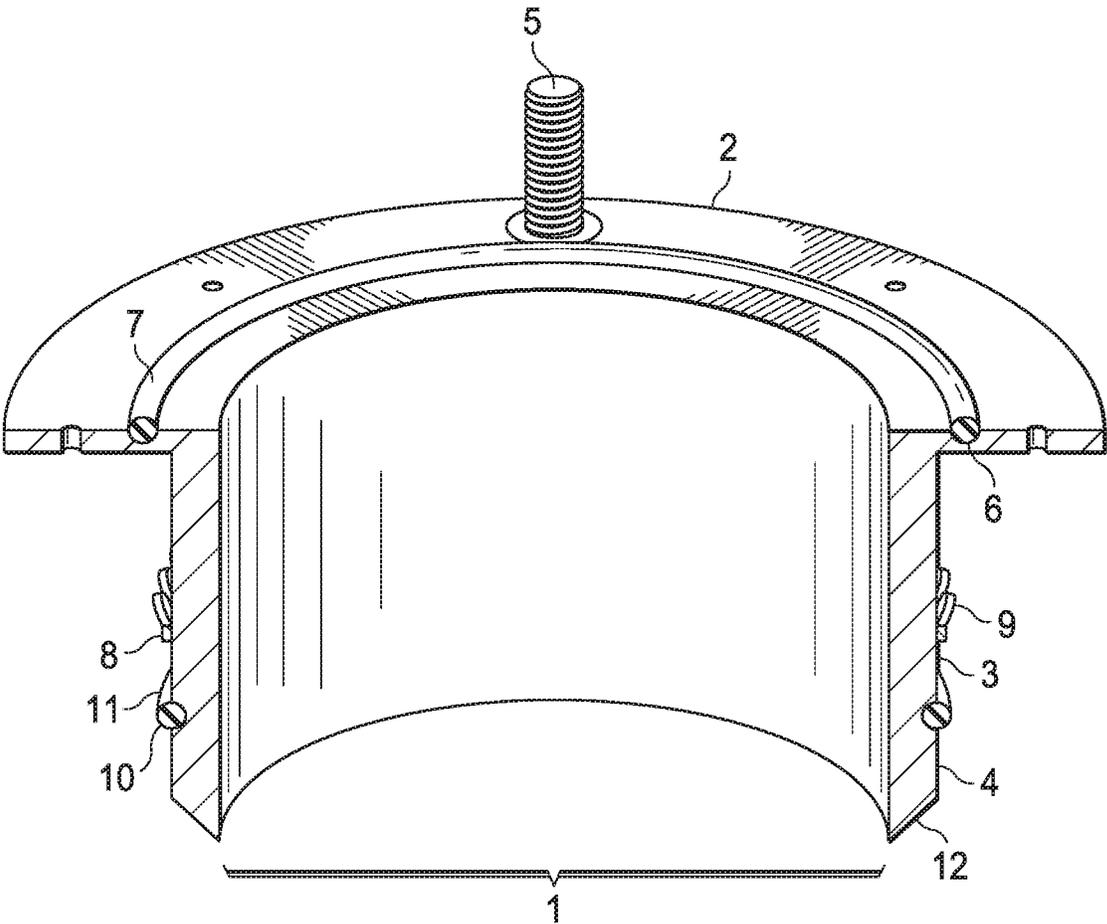


FIG. 3

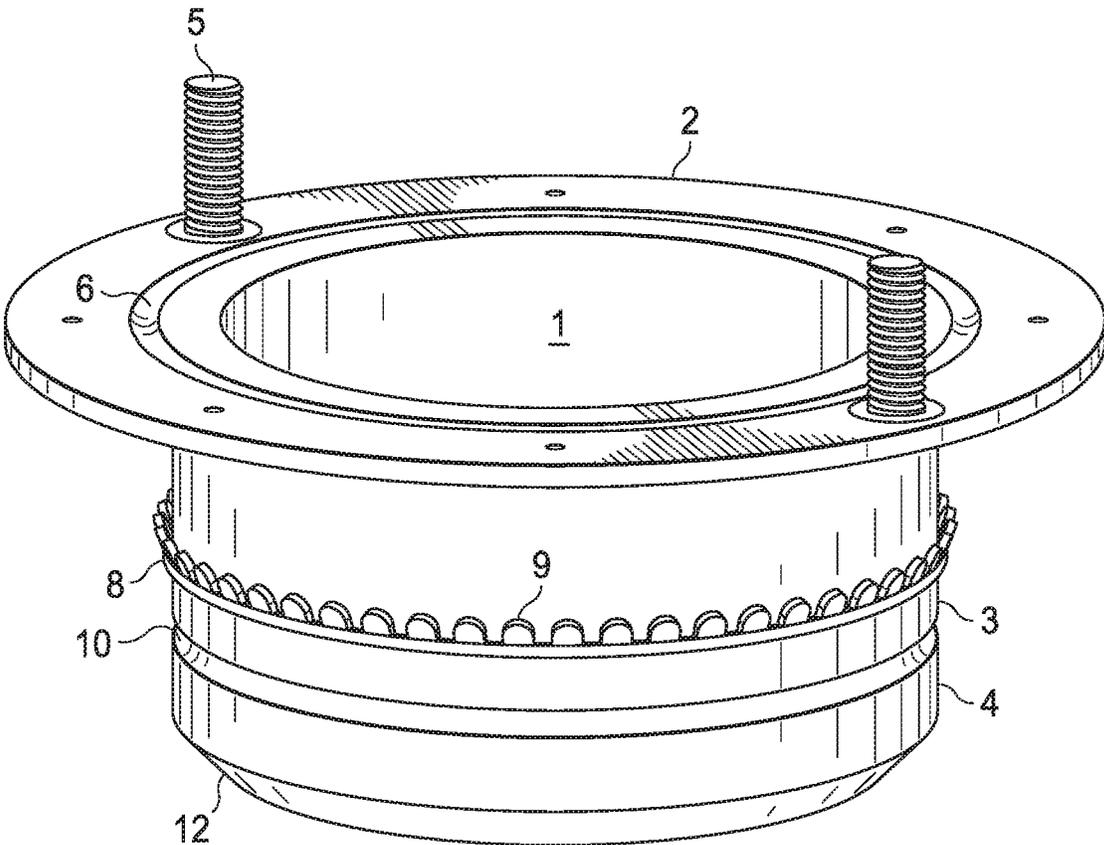


FIG. 4

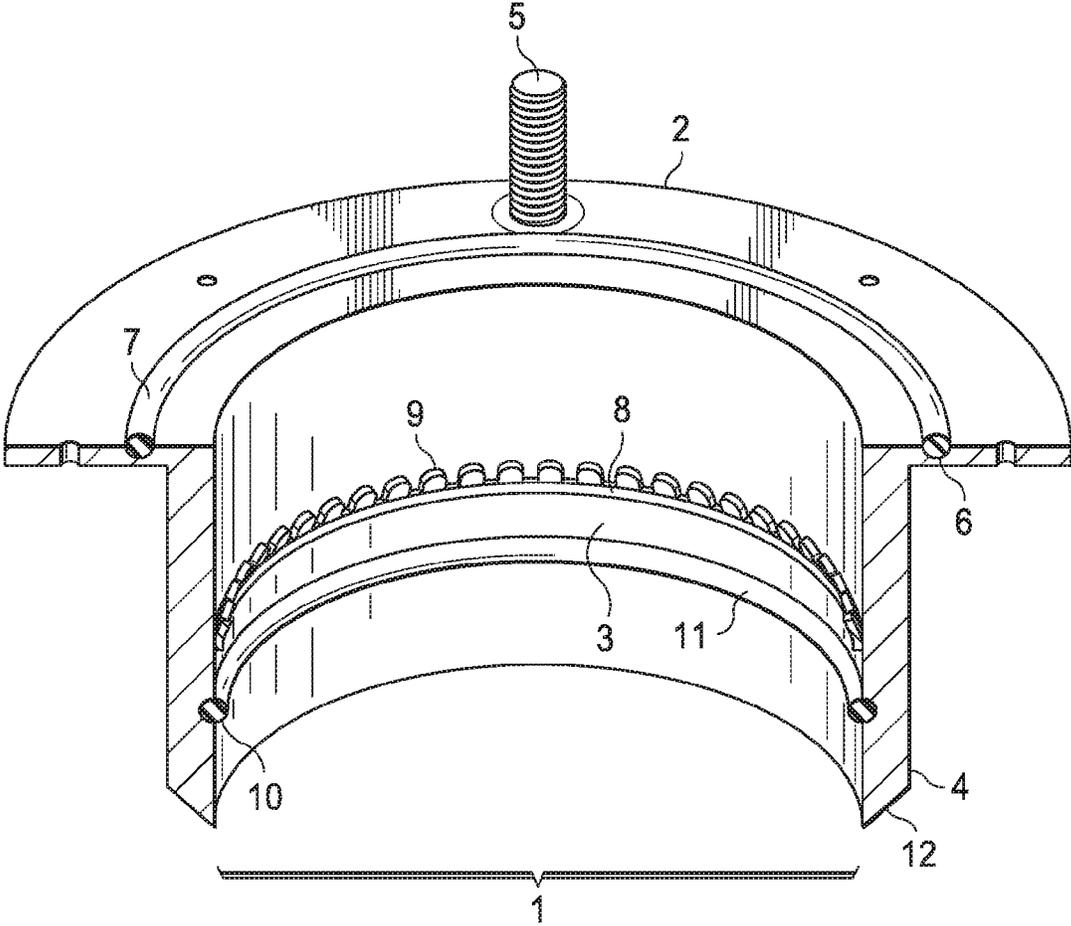


FIG. 5

SELF-SEALING CLOSET FLANGE

CROSS-REFERENCE TO RELATED APPLICATION

[0001] The present application claims the benefit of and priority to U.S. patent application Ser. No. 13/930,461 titled, "Self-Sealing Closet Flange" filed Jun. 28, 2013, which is fully incorporated herein in its entirety by this reference.

FIELD OF THE INVENTION

[0002] This invention relates to construction, and more specifically to a system and method for the installation of a plumbing flange.

BACKGROUND OF THE INVENTION

[0003] Plumbing repairs are required in both new construction homes and as well as existing homes. Traditionally, a water closet, commode, or toilet is attached to the floor surface via a water closet flange also known as a closet flange or toilet flange. A closet flange is a pipe fitting that connects the toilet to the floor and connects the toilet drain to the floor drain pipe. Typically, a wax ring or glue seals any space between the flange and the bottom of the toilet to prevent the escape of potentially hazardous gases or fluids. The toilet is usually bolted to the flange after the flange is installed in the drain. The flange is typically made of PVC, cast iron, brass or steel pipe. Closet flanges are usually positioned between the bottom of a toilet and the bathroom floor surface so that any water flushed from the toilet goes directly into the floor drain pipe. A partial section of drain pipe must be exposed for installation of the traditional closet flange since the traditional closet flange is usually installed around the outside of the pipe. A damaged or broken closet flange presents numerous problems such as leaking of water or sewer gases, which may cause damage to connected rooms.

[0004] Oftentimes, the drain pipe is surrounded by cardboard and concrete that must be trimmed away before installation of the toilet flange. Plumbers must dig out cardboard, chisel surrounding concrete, glue flange to exterior of drain pipe and cut the drain pipe to the proper height to accommodate the wax ring. Even if the traditional flange were inserted inside the drain pipe, the opening of the PVC pipe would be too small. The installation process can last 20-30 minutes and at least two (2) people are usually required to position the toilet properly over drain pipe on floor surface. With a traditional closet flange, there is no visibility underneath the toilet as the plumber attempts to set the toilet above the drain pipe and keep the rectangular bolts upright in the flange slots. Two plumbers are typically required so that one can lower the toilet and the second can view the underside of the toilet as it is lowered to the drain pipe and keep the rectangular bolts in place.

[0005] In addition, a wax ring is usually placed at the floor surface between the bottom of the toilet and the drain pipe to create a seal to prevent the escape of sewage gases and fluids. An ideal wax ring is large enough to form a good seal between the toilet and the floor but not so large as to create a pipe obstruction once the wax ring is compressed. The height of the wax ring will depend on the amount of space between the floor and the toilet such that a taller wax ring is

required for a larger space. Care must be taken to use the proper size wax ring or a pipe obstruction may be created from excess wax.

[0006] The length of the bolt required may vary from installation to installation and depends on the height of the wax ring as well as the distance between the floor and the pipe surface underneath the toilet. Most of the time, the chosen bolt will be too long and will have to be cut after installation of the toilet so that the bolt covers may be attached. In addition, the bolts used to attach the flange to the toilet are also subject to corrosion over time, which may also contribute to leaking from an unsecured toilet flange. When the plumber needs to remove a corroded bolt, oftentimes the nut won't unscrew since the bolt threads are also corroded. In order to remove the corroded nut and/or bolt, the plumber will have to first saw the nut off.

[0007] Traditional closet flanges are subject to wear and tear resulting in rust and/or corrosion of the components of the closet flange. With a weakened closet flange, there is no advance notice of a leak until hazardous water or gas is already on a floor surface, in a bathroom or leaking into a building structure. At that point, people have already been exposed to the potentially hazardous material by stepping, walking or crawling in, breathing or touching it. Plumbing leaks can also damage surrounding properties or units in cases of multi-level apartments or commercial building structures. A single leak can quickly spread and cause extensive damage to a property.

[0008] The self-sealing closet flange was created to address many of the shortfalls of the traditional closet flange. In this embodiment, the self-sealing closet flange is made of stainless steel and not susceptible to rust or corrosion, which would weaken the closet flange. The bolts of the self-sealing closet flange are attached and made of the same long lasting material as the self-sealing closet flange. The self-sealing closet flange prevents leaks from the bottom of the toilet without use of the messy wax ring. The self-sealing closet flange can be placed either inside or outside the drain pipe, which may either extend above the floor surface or be cut flush with the floor surface. The entire self-sealing closet flange is attached to the bottom of the toilet before the toilet placed in position on floor. The self-sealing closet flange also provides increased space between the floor surface and the toilet bottom since there is no wax ring and allows for easier installation of the self-sealing closet flange over a broken toilet flange or for a new installation. In addition, no post-installation adjustment is required since the self-sealing closet flange is already attached to bottom of toilet.

SUMMARY OF THE INVENTION

[0009] The present system and method involves a self-sealing closet flange. The self-sealing closet flange is made from a single casting of steel, brass, aluminum, plastic, or a similarly sturdy and reliable material. The self-sealing closet flange is comprised of a flat circular anterior end with a center opening, attached bolts and an O-ring groove positioned between the attached bolts and the center opening. The mid-section of the self-sealing closet flange is attached to the lower side of the anterior end and is composed of a tubular section of a similar diameter as the center opening at the anterior end with a keeper ring and groove around the tubular section. The posterior end of the self-sealing closet flange is attached to the midsection and is also composed of a tubular section of similar diameter with a beveled edge to

the center opening and the midsection. In addition to the traditional toilet, the self-sealing closet flange may also be used for wall commodes and urinals.

[0010] The benefit of the self-sealing closet flange is that leaks are unlikely to occur, and if they do, the frequency will be much lower than the leaks that occur approximately every 4-5 years with traditional closet flanges and wax rings. In addition, the self-sealing closet flange greatly reduces the spread of disease caused by leaks of sewer gases and fluids. The toilet installed with the self-sealing closet flange will also not sway if a bolt is loose or corroded or if the wax ring is damaged since the flange is attached to the toilet. Typical residential drain pipes are below the concrete slab and made of PVC. Traditional flanges are also made of PVC so that it can be glued to the PVC drain pipe. The self-sealing closet flange may be made of stainless steel which doesn't require gluing to the drain pipe to be secure. The stainless steel self-sealing closet flange also prevents frequent corrosion and degradation of the self-sealing closet flange. Typical commercial buildings have drain pipes below the concrete, also made of PVC, but above the concrete. Drain pipes are usually made of cast iron to prevent the release of toxic gases from PVC into the commercial structure. The self-sealing closet flange works with both PVC and cast iron since it is preferably constructed of stainless steel. Overall, the self-sealing closet flange is a quicker, less complicated flange that is cheaper to install since there are not multiple components as with the traditional closet flange.

[0011] The anterior portion of the self-sealing closet flange is a round, circular disk with a center opening. The center opening is similar in diameter to the drain pipe. There is a depression or groove between the center opening and the outer edge of the anterior end of the self-sealing closet flange. In this embodiment, an O-ring may be placed in this anterior groove to create a seal between the toilet and the self-sealing closet flange. The seal created by the O-ring and the bottom surface of the toilet eliminates the need for a messy wax ring and also increases the available space between the floor surface the bottom of the toilet. The casting of the self-sealing closet flange also includes dual bolts attached to the upper surface of the anterior end at opposite sides of said anterior end. The heads of the attached bolts are flush with the underside of the anterior end of the self-sealing closet flange. The threaded shanks of the attached bolts rise above the upper side of the anterior end of the self-sealing closet flange. In this embodiment, there are two (2) bolts, which are positioned directly across from one another on opposite sides of the self-sealing closet flange. In this embodiment, the attached bolts are rectangular shaped bolt heads. With attached bolts, there is no need to estimate the size of the bolts required for flange installation nor is there a need to saw off excess bolt in order to attach bolt covers after installation. The attached bolts save materials and time and therefore lower the cost of flange installation.

[0012] The self-sealing closet flange also contains at least one groove for an O-ring or similar device. An O-ring or toric joint, is a loop of elastomer with a round cross section, which can be seated in the groove of the self-sealing closet flange. Once the toilet, with the self-sealing closet flange, is positioned over the drain pipe, a seal is created without the necessity of the messy wax ring. There may also be a groove at the midsection of the self-sealing closet flange for a second O-ring. The secondary groove may be positioned

inside or outside The seal is designed to have a point of contact between the O-ring and the sealed surfaces, which allows the O-ring to handle high pressure and stress. The flexibility of the O-ring allows use with a variety of surfaces and materials. The O-ring seals the connection points between the surfaces, preventing the escape of fluids or gases. The O-ring replaces the function of the wax ring used with the traditional flange. The self-sealing closet flange uses an O-ring to create a seal and prevent gas and fluid from leaking out of the drain pipe and onto the floor surface. In use, an O-ring would be placed in the upper O-ring groove; the attached bolts would be inserted into the corresponding holes at the bottom of the toilet before the self-sealing closet flange and toilet were placed over the drain pipe in the floor surface. An O-ring may also be placed in the lower O-ring groove, at the self-sealing closet flange midsection, to prevent fluids or gas from rising above the self-sealing closet flange.

[0013] A single self-sealing closet flange can be used on drain pipes of varying sizes depending on whether the closet flange will be outside or inside the pipe. In this embodiment, the self-sealing closet flange is positioned inside the drain pipe and the space between the self-sealing closet flange and drain pipe is filled by an O-ring positioned around the exterior edge of the self-sealing closet flange mid section in an O-ring depression. This secondary O-ring and O-ring depression prevents the escape of fluids or gases outside of the drain pipe. If the self-sealing closet flange is instead placed outside the drain pipe, the O-ring, O-ring depression and keeper ring will be positioned on the interior surface of the self-sealing closet flange mid-section.

[0014] The keeper ring is located along the midsection of the self-sealing closet flange and surrounds the circumference of the midsection, in this embodiment. The keeper ring is a ring of teeth or protrusions that secure the self-sealing closet flange within the pipe. However, in an alternative embodiment, wherein the ring has at least one tooth or protrusion, the function would be similar as an entire ring of protrusions. The teeth fold in as the self-sealing closet flange is inserted into drain pipe. If the self-sealing closet flange is pulled in the opposite direction, the teeth will fold out as more upward pressure is applied to the self-sealing closet flange, which prevents the removal of the self-sealing closet flange. As any amount of upward pressure is applied to the self-sealing closet flange, the protrusions of the keeper ring will become embedded in the drain pipe surface, preventing removal of the self-sealing closet flange. Whether there are a few or many teeth or protrusions, the protrusions will prevent the removal of the self-sealing closet flange as the teeth embed themselves into the drain pipe. A full ring or band of teeth or protrusions is the preferred embodiment however. The inserted self-sealing closet flange can be adjusted by twisting and side to side movements but cannot be removed with upward or downward pressure. The teeth or protrusions may be a variety of shapes such as round, pointed, rectangular, serrated, or any other shape that will prevent removal of the self-sealing closet flange from a drain pipe. However, should the user desire to insert the self-sealing closet flange around the drain pipe, the O-ring, O-ring depression, and keeper ring could instead be located on the interior of the self-sealing closet flange. Should the user decide to remove the self-sealing closet flange from the drain pipe, the user can saw through the self-sealing closet flange, up to but not through the drain pipe, and remove the

pieces of the split self-sealing closet flange. Once the self-sealing closet flange system is in place, caulk may be applied at the point connecting the base of the toilet and the floor surface to prevent movement.

[0015] The present system also includes a secondary O-ring depression and O-ring positioned on the midsection of the self-sealing closet flange, beneath the keeper ring, to create a seal between the self-sealing closet flange and drain pipe. The secondary O-ring depression and O-ring serves to prevent fluids or gases from escaping the pipe drain. If the drain pipe surface is not flat, then a gasket may be used in place of O-ring. Gaskets can fill irregularities between uneven mating surfaces to fill space and create seals to prevent leakage. The position of the O-ring depression and O-ring also prevents fluids or gas from interacting with the keeper ring, since the keeper ring is above the O-ring depression and O-ring and closer to the anterior end of the self-sealing closet flange. If water or other fluids came in contact with the keeper ring, the keeper ring may start to rust or deteriorate. Since the keeper ring stays dry in the present system, it should not require replacement due to rust or corrosion.

[0016] The bottom or posterior end of the self-sealing closet flange is beveled or notched to increase its flexibility and ease of insertion into the drain pipe. The beveled edge of the posterior end allows for the insertion of the self-sealing closet flange into drain pipes of varied sizes.

[0017] The entire self-sealing closet flange system is faster to replace than a traditional closet flange and wax ring because there are fewer components to the system and installation can be accomplished with a single person. There is no need to remove the old flange in order to install the self-sealing closet flange. The user can also avoid wasting materials by cutting excess pipe or bolts. The self-sealing closet flange is secured to the floor and toilet without the support of the concrete around the drain pipe. In a traditional system, concrete and cardboard surrounding the drain pipe would need to be chiseled away before the toilet flange could be installed. The self-sealing closet flange system can be installed with a single person, whereas the traditional closet flange installation is usually a two-person task. The self-sealing closet flange is also not as messy as traditional closet or toilet flange system since a wax ring is not required. The self-sealing closet flange can be replaced without the need to chip away any concrete or floor surface material surrounding the drain pipe, as is required with traditional closet flanges.

OBJECTS OF THE INVENTION

[0018] An object of the present invention is to provide a self-sealing closet flange that is not susceptible to wear and tear and does not require replacement on a regular basis.

[0019] Another object of the present invention is to reduce the time and labor required for the installation of toilet flanges.

[0020] Another object of the present invention is to provide a self-sealing closet flange that seals without the requirement of a messy wax ring.

[0021] Another object of the present invention is to provide a self-sealing closet flange that prevents leaks and potential damage to floor surface and building structures.

[0022] Another object of the present invention is to provide a self-sealing closet flange that can be installed without disturbing the floor surface to reveal the top of the drain pipe.

BRIEF DESCRIPTION OF DRAWINGS

[0023] FIG. 1 is a perspective view of the self-sealing closet flange installed beneath a toilet and inside a drain pipe;

[0024] FIG. 2 is a top view of the anterior end of the self-sealing closet flange;

[0025] FIG. 3 is an interior view of the self-sealing closet flange;

[0026] FIG. 4 is a perspective view of the self-sealing closet flange;

[0027] FIG. 5 is an interior, cut away view of the self-sealing closet flange, showing an alternative embodiment for placement on the outside of a drain pipe.

DETAILED DESCRIPTION OF DRAWINGS

[0028] While the above description is of the preferred embodiment of the present invention, it should be appreciated that the invention may be modified, altered, or varied without deviating from the scope and fair meaning of the following claims.

[0029] Referring generally to FIGS. 1-4, the self-sealing closet flange is a closet or toilet flange that connects the toilet drain and the drain pipe from the floor surface. The entire self-sealing closet flange system is attached to the bottom of a toilet, wherein the attached self-sealing closet flange and toilet are placed above a drain pipe on the floor surface. The anterior end of the self-sealing closet flange includes attached bolts, a groove, and a center opening. The midsection of the self-sealing closet flange includes a keeper ring with a series of teeth or protrusions, a second groove. The posterior end of the self-sealing closet flange is beveled for easier insertion of the posterior end into a drain pipe.

[0030] FIG. 1 is a perspective view of the self-sealing closet flange installed beneath a toilet and inside a drain pipe.

[0031] In FIG. 1, Ref 1 is the center opening of the self-sealing closet flange;

[0032] Ref. 2 is the anterior end of the self-sealing closet flange;

[0033] Ref. 3 is the midsection of the self-sealing closet flange;

[0034] Ref. 4 is the posterior end of the self-sealing closet flange;

[0035] Ref. 5 is an attached bolt at the anterior end of the self-sealing closet flange;

[0036] Ref. 6 is the groove at the anterior end of the self-sealing closet flange;

[0037] Ref. 7 is an O-ring in the groove at the anterior end of the self-sealing closet flange;

[0038] Ref. 8 is the keeper ring at the midsection of the self-sealing closet flange;

[0039] Ref. 9 is a protrusion of the keeper ring;

[0040] Ref. 10 is the groove in the midsection of the self-sealing closet flange;

[0041] Ref. 11 is an O-ring in the groove at the midsection of the self-sealing closet flange;

[0042] Ref. 12 is the beveled edge at the posterior end of the self-sealing closet flange;

[0043] Ref. 13 is a toilet;

[0044] Ref. 14 is the floor surface;

[0045] Ref. 15 is the drain pipe.

[0046] Unlike the traditional flange system, the self-sealing closet flange provides a considerable amount of space

between the floor surface and the toilet bottom despite the presence of the self-sealing closet flange. The anterior end of the self-sealing closet flange includes attached bolts with the bolt head flush to the bottom side of the anterior end of the self-sealing closet flange and the shank of the bolt directed above the top side of the anterior end of the self-sealing closet flange. Immediately below the anterior end of the self-sealing closet flange is the midsection of the self-sealing closet flange. The midsection is a section of flange that is a similar circumference as the center opening. Water or waste would flow from the toilet, through the center opening and through the midsection of the self-sealing closet flange. A keeper ring is positioned on the outer surface of the self-sealing closet flange. The keeper ring is a ring of protrusions or teeth surrounding the outside of the midsection of the self-sealing closet flange.

[0047] As the self-sealing closet flange is inserted into the drain pipe, the teeth will fold inward to facilitate insertion of the self-sealing closet flange into the drain pipe. If the self-sealing closet flange is pulled in an upward direction in an attempt to remove the self-sealing closet flange, the teeth will fold or bend outward and prevent the removal of the self-sealing closet flange from the drain pipe. A secondary groove and O-ring are positioned immediately below the keeper ring on the outer surface of the midsection of the self-sealing closet flange and fills any space existing between the interior of the drain pipe and the exterior of the self-sealing closet flange. The secondary O-ring should be of sufficient girth to prevent the escape of any noxious gases or waste fluids from the drain pipe. The bottom of the posterior end of the self-sealing closet flange is of a slightly smaller diameter than the midsection or the center opening allowing for straightforward insertion of the self-sealing closet flange into the drain pipe. In addition, the bottom of the posterior end may also be beveled or notched. Once water or waste passes through the midsection of the self-sealing closet flange, it would then pass through the posterior end and through the drain pipe.

[0048] FIG. 2 is a top view of the anterior end of the self-sealing closet flange.

[0049] In FIG. 2, Ref. 1 is the center opening of the self-sealing closet flange;

[0050] Ref. 2 is the anterior end of the self-sealing closet flange;

[0051] Ref. 5 is an attached bolt at the anterior end of the self-sealing closet flange;

[0052] Ref. 6 is the groove at the anterior end of the self-sealing closet flange;

[0053] Ref. 7 is an O-ring in the groove at the anterior end of the self-sealing closet flange.

[0054] The anterior end of the self-sealing closet flange is a round, circular surface with a center opening, or hole in the middle of the anterior end. There is an outer edge of the anterior end and an inner edge of the anterior end of the self-sealing closet flange. The outer edge has a larger circumference than the inner edge, wherein the inner edge is also the top portion of the center opening. The center opening is of a similar diameter to the drain pipe since any water from the toilet will pass through the center opening towards the drain pipe. A groove or depression is positioned between the inner edge of the anterior end and the outer edge of the anterior end. In this embodiment, an O-ring is placed in the groove or depression to create a seal between the

bottom of the toilet and the top surface of the anterior end of the self-sealing closet flange.

[0055] The self-sealing closet flange also includes two attached bolts, in this embodiment. The attached bolts are positioned directly across from one another. The bolts are created during a single casting of the entire self-sealing closet flange such that the heads of said attached bolts are flush with the bottom side of the anterior end and the threaded shank of the attached bolts rises above the top side of the anterior end of the self-sealing closet flange. In use, the self-sealing closet flange would be attached to the bottom of the toilet by inserting the attached bolts of the self-sealing closet flange through the precut holes at the base of the toilet. After the combination of the toilet and attached self-sealing closet flange are installed over the drain pipe, bolt caps would be screwed over the shanks of the attached bolts to complete installation and to cover the exposed bolts.

[0056] FIG. 3 is an interior, cut away view of the self-sealing closet flange, which shows the anterior end, mid-section and posterior end of the self-sealing closet flange.

[0057] In FIG. 3, Ref. 1 is the center opening of the self-sealing closet flange;

[0058] Ref. 2 is the anterior end of the self-sealing closet flange;

[0059] Ref. 3 is the midsection of the self-sealing closet flange;

[0060] Ref. 4 is the posterior end of the self-sealing closet flange;

[0061] Ref. 5 is an attached bolt at the anterior end of the self-sealing closet flange;

[0062] Ref. 6 is the groove at the anterior end of the self-sealing closet flange;

[0063] Ref. 7 is an O-ring in the groove at the anterior end of the self-sealing closet flange;

[0064] Ref. 8 is the keeper ring at the midsection of the self-sealing closet flange;

[0065] Ref. 10 is the groove in the midsection of the self-sealing closet flange;

[0066] Ref. 11 is an O-ring in the groove at the midsection of the self-sealing closet flange;

[0067] Ref. 12 is the beveled edge at the posterior end of the self-sealing closet flange.

[0068] The anterior end of the self-sealing closet flange includes an attached bolt with the bolt head flush to the bottom side of the anterior end of the self-sealing closet flange and the shank of the bolt directed above the top side of the anterior end of the self-sealing closet flange. An O-ring groove is positioned between the center opening and the outer edge of the anterior end of the self-sealing closet flange. Immediately below the anterior end of the self-sealing closet flange is the midsection of the self-sealing closet flange. The midsection is a section of flange that is a similar circumference as the center opening. Water or waste would flow from the toilet, through the center opening and through the midsection of the self-sealing closet flange. A keeper ring is positioned on the outer surface of the self-sealing closet flange. The keeper ring is a ring of protrusions or teeth surround the outside of the midsection of the self-sealing closet flange. As the self-sealing closet flange is inserted into the drain pipe, the teeth will fold inward to facilitate insertion of the self-sealing closet flange into the drain pipe. If the self-sealing closet flange is pulled in an upward direction in an attempt to remove the self-sealing closet flange, the teeth will fold or bend outward and prevent

the removal of the self-sealing closet flange from the drain pipe. And the upward pulling force increases, the teeth will continue to plant themselves in the outer surface of the midsection of the self-sealing closet flange. The teeth may be rounded, rectangular, pointed, serrated or any other shape that would serve a similar purpose.

[0069] In this embodiment, a secondary groove and O-ring are positioned immediately below the keeper ring on the outer surface of the midsection of the self-sealing closet flange. The secondary O-ring fills any space existing between the interior of the drain pipe and the exterior of the self-sealing closet flange. The size of the O-ring will be determined by the amount of space existing between the interior of the drain pipe and the exterior of the self-sealing closet flange. The secondary O-ring should be of sufficient girth to prevent the escape of any noxious gases or waste fluids from the drain pipe. The posterior end of the self-sealing closet flange is located immediately below the midsection of the self-sealing closet flange. The bottom of the posterior end of the self-sealing closet flange is of a slightly smaller diameter than the midsection or the center opening. The smaller size of the bottom allows for straightforward insertion of the self-sealing closet flange into the drain pipe. In addition, the bottom of the posterior end may also be beveled or notched to increase the flexibility of the posterior end as it is inserted into a possibly tight drain pipe.

[0070] FIG. 4 is a perspective view of the entire self-sealing closet flange, not in position with a toilet, floor surface and drain pipe.

[0071] In FIG. 4, Ref. 1 is the center opening of the self-sealing closet flange;

[0072] Ref. 2 is the anterior end of the self-sealing closet flange;

[0073] Ref. 3 is the midsection of the self-sealing closet flange;

[0074] Ref. 4 is the posterior end of the self-sealing closet flange;

[0075] Ref. 5 is an attached bolt at the anterior end of the self-sealing closet flange;

[0076] Ref. 6 is the groove at the anterior end of the self-sealing closet flange;

[0077] Ref. 8 is the keeper ring at the midsection of the self-sealing closet flange;

[0078] Ref. 9 is a protrusion of the keeper ring;

[0079] Ref. 10 is the groove in the midsection of the self-sealing closet flange;

[0080] Ref. 12 is the beveled edge at the posterior end of the self-sealing closet flange.

[0081] The anterior end of the self-sealing closet flange includes an attached bolt with the bolt head flush to the bottom side of the anterior end of the self-sealing closet flange and the shank of the bolt directed above the top side of the anterior end of the self-sealing closet flange. An O-ring groove is positioned between the center opening and the outer edge of the anterior end of the self-sealing closet flange. Immediately below the anterior end of the self-sealing closet flange is the midsection of the self-sealing closet flange. The midsection is a section of flange that is a similar circumference as the center opening. Water or waste would flow from the toilet, through the center opening and through the midsection of the self-sealing closet flange.

[0082] A keeper ring is positioned on the outer surface of the self-sealing closet flange. As the self-sealing closet flange is inserted into the drain pipe, the teeth will fold

inward to facilitate insertion of the self-sealing closet flange into the drain pipe. If the self-sealing closet flange is pulled in an upward direction in an attempt to remove the self-sealing closet flange, the teeth will fold or bend outward and prevent the removal of the self-sealing closet flange from the drain pipe. A secondary groove and O-ring are positioned immediately below the keeper ring on the outer surface of the midsection of the self-sealing closet flange and fill any space existing between the interior of the drain pipe and the exterior of the self-sealing closet flange. The secondary O-ring should be of sufficient girth to prevent the escape of any noxious gases or waste fluids from the drain pipe. The bottom of the posterior end of the self-sealing closet flange is of a slightly smaller diameter than the midsection or the center opening allowing for straightforward insertion of the self-sealing closet flange into the drain pipe. In addition, the bottom of the posterior end may also be beveled or notched to increase the flexibility of the posterior end as it is inserted into a possibly tight drain pipe.

[0083] FIG. 5 is an interior, cut away view of the self-sealing closet flange, showing an alternative embodiment for placement on the outside of a drain pipe, which shows the anterior end, midsection, and posterior end of the self-sealing closet flange.

[0084] In FIG. 5, Ref. 1 is the center opening of the self-sealing closet flange;

[0085] Ref. 2 is the anterior end of the self-sealing closet flange;

[0086] Ref. 3 is the midsection of the self-sealing closet flange;

[0087] Ref. 4 is the posterior end of the self-sealing closet flange;

[0088] Ref. 5 is an attached bolt at the anterior end of the self-sealing closet flange;

[0089] Ref. 6 is the groove at the anterior end of the self-sealing closet flange;

[0090] Ref. 7 is an O-ring in the groove at the anterior end of the self-sealing closet flange;

[0091] Ref. 8 is the keeper ring at the midsection of the self-sealing closet flange;

[0092] Ref. 9 is a protrusion of the keeper ring;

[0093] Ref. 10 is the groove in the midsection of the self-sealing closet flange;

[0094] Ref. 11 is an O-ring in the groove at the midsection of the self-sealing closet flange;

[0095] Ref. 12 is the beveled edge at the posterior end of the self-sealing closet flange.

[0096] The anterior end of the self-sealing closet flange includes an attached bolt with the bolt head flush to the bottom side of the anterior end of the self-sealing closet flange, and the shank of the bolt directed above the top side of the anterior end of the self-sealing closet flange. An O-ring groove is positioned between the center opening and the outer edge of the anterior end of the self-sealing closet flange. Immediately below the anterior end of the self-sealing closet flange is the midsection of the self-sealing closet flange. The midsection is a section of flange that has a similar circumference as the center opening. Water or waste would flow from the toilet, through the center opening, and through the midsection of the self-sealing closet flange.

[0097] In this embodiment, the keeper ring is positioned on the inner surface of the self-sealing closet flange. As the self-sealing closet flange is placed onto the outside of the

drain pipe, the teeth will fold outward to facilitate insertion of the self-sealing closet flange onto the outside of the drain pipe. If the self-sealing closet flange is pulled in an upward direction in an attempt to remove the self-sealing closet flange, the teeth will fold or bend inward, against the outside of the drain pipe, and prevent the removal of the self-sealing closet flange from the drain pipe. A secondary groove and O-ring are positioned immediately below the keeper ring on the inner surface of the midsection of the self-sealing closet flange and fill any space existing between the exterior of the drain pipe and the interior of the self-sealing closet flange. The secondary O-ring should be of sufficient girth to prevent the escape of any noxious gases or waste fluids from the drain pipe. The bottom of the posterior end of the self-sealing closet flange is of a slightly smaller diameter than the midsection or the center opening, thereby allowing for straightforward insertion of the self-sealing closet flange onto the drain pipe. In addition, the bottom of the posterior end may also be beveled or notched to increase the flexibility of the posterior end as it is inserted onto a possibly tight drain pipe.

[0098] In view of the foregoing detailed description of preferred embodiments of the present invention, it readily will be understood by those persons skilled in the art that the present invention is susceptible to broad utility and application. While various aspects have been described in the context of a preferred embodiment, additional aspects, features, and methodologies of the present invention will be readily discernible therefrom any embodiments and adaptations of the present invention other than those herein

described, as well as many variations, modifications, and equivalent arrangements and methodologies, will be apparent from or reasonably suggested by the present invention and the foregoing description thereof, without departing from the substance or scope of the present invention. Additionally, any sequence or order of steps of various methods described and claimed herein are those considered to be the best mode for the present invention. However, it should be understood that the steps may be carried out in any particular sequence or order or even simultaneously, absent a specific indication of such to achieve a particular result. Accordingly, while the present invention has been described herein in detail in relation to preferred embodiments, it is to be understood that this disclosure is only illustrative and exemplary of the present invention and is made merely for purposes of providing a full and enabling disclosure of the invention. The foregoing disclosure is not intended nor is it to be construed to limit the present invention or otherwise to exclude any such other embodiments, adaptations, variations, modifications and equivalent arrangements, the present invention being limited only by the claims below and their equivalents.

What is claimed:

1. A closet flange system for connecting a toilet to a drain, said closet flange system comprising:
 - a rim with at least one opening, wherein said rim consists of an upper surface and a lower surface;
 - a tube with a first end and a second end; and
 - at least one bolt.

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