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(54) **ADJUSTABLE DRAIN ASSEMBLY**

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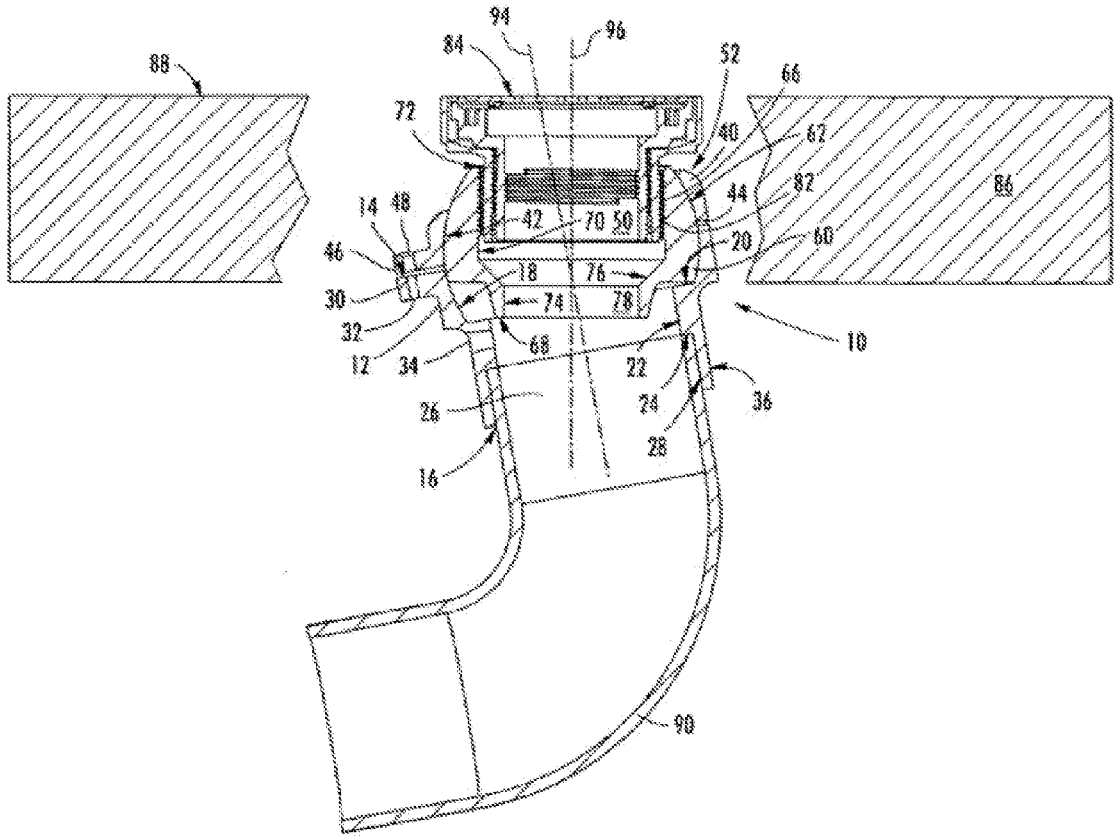
(57) **ABSTRACT**

An adjustable drain assembly is provided. The assembly includes a base that has a concave inner pivoting surface and a top surface. An upper member is present and has a bottom surface located above the top surface. The upper member may have a concave inner pivoting surface. A pivot component may be present and have a convex outer pivoting surface that engages the concave inner pivoting surface of the base and upper member. The pivot component may be configured for engagement with a cover member. The base may have a pipe engagement surface for engagement with a pipe that is located completely below the pivot component.



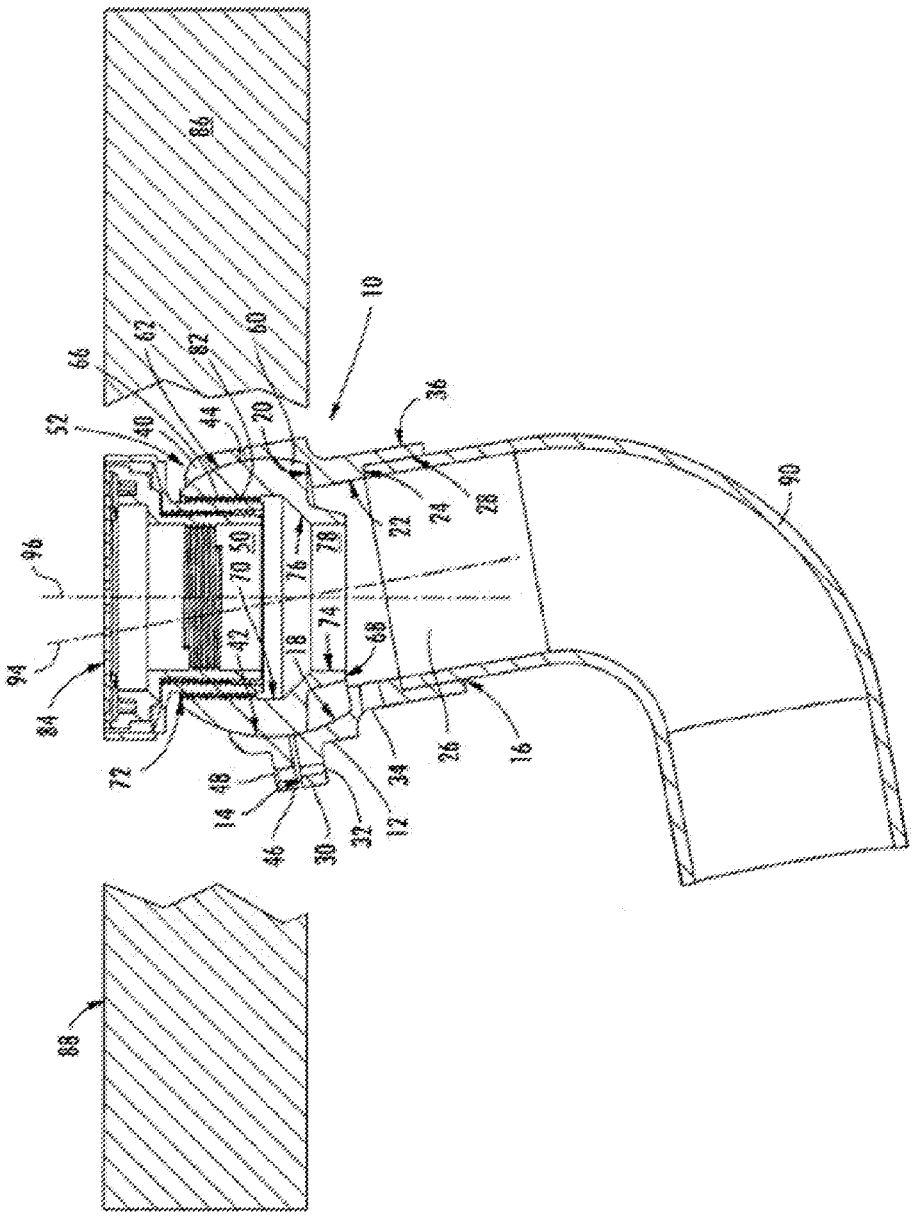

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Fig. 1

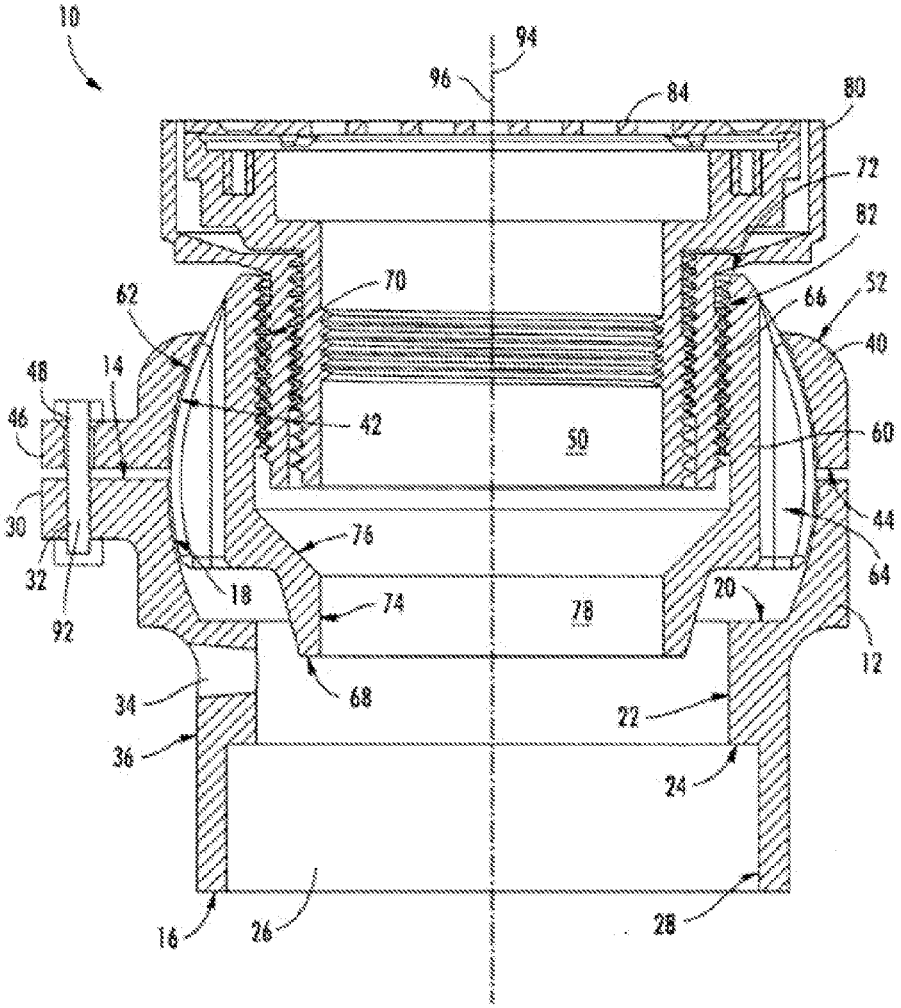
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Fig. 2

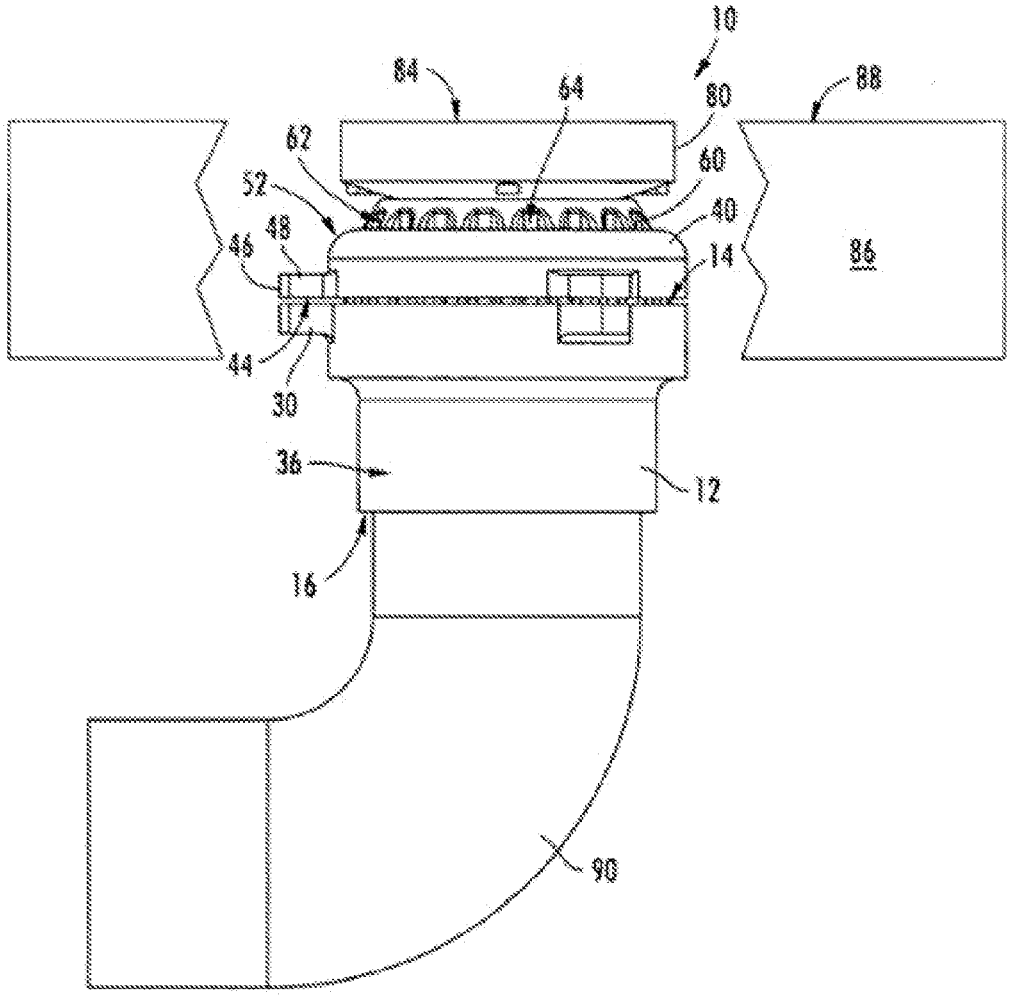

Fig. 3

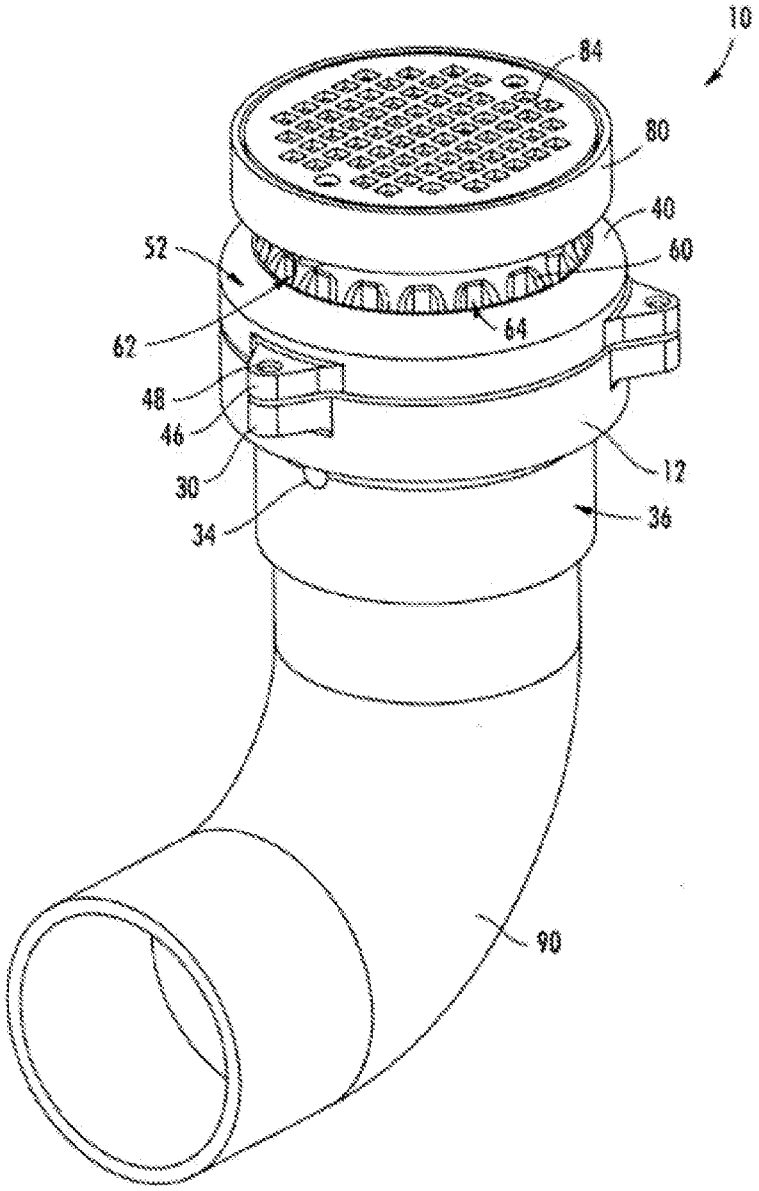

Fig. 4

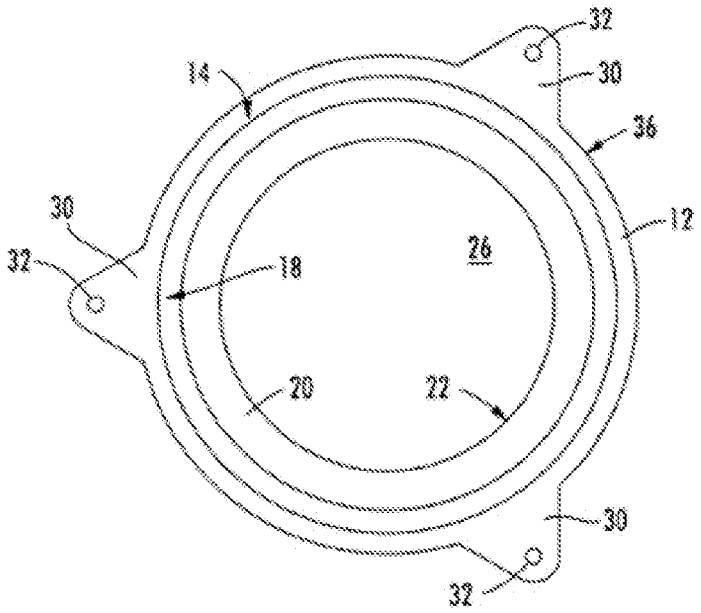

Fig. 5

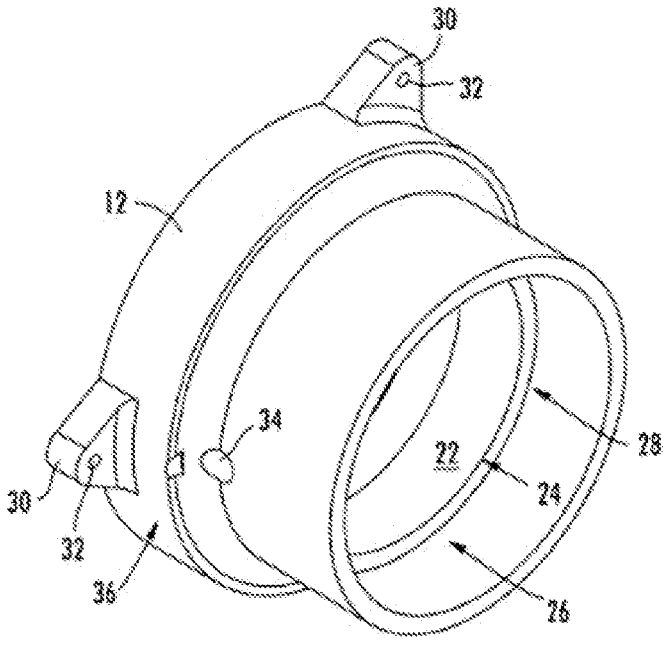

Fig. 6

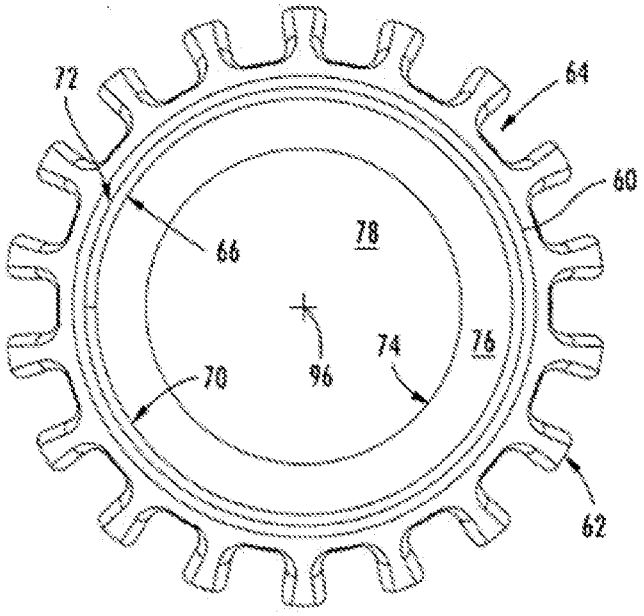

Fig. 7

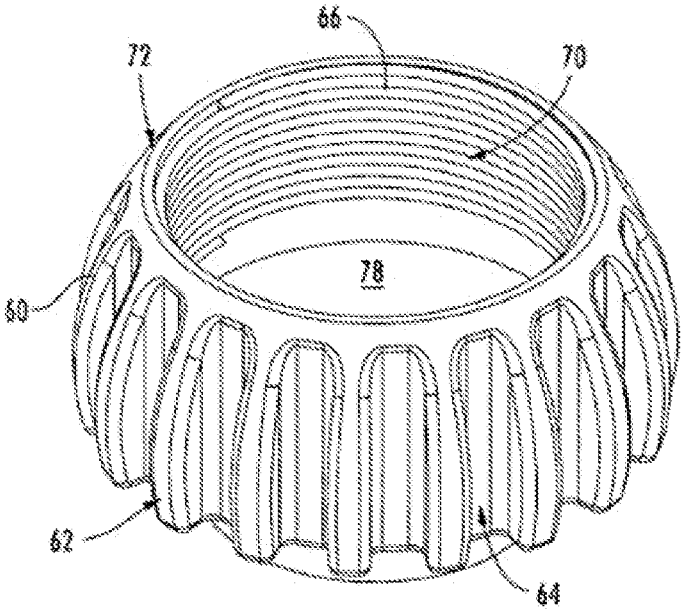

Fig. 8

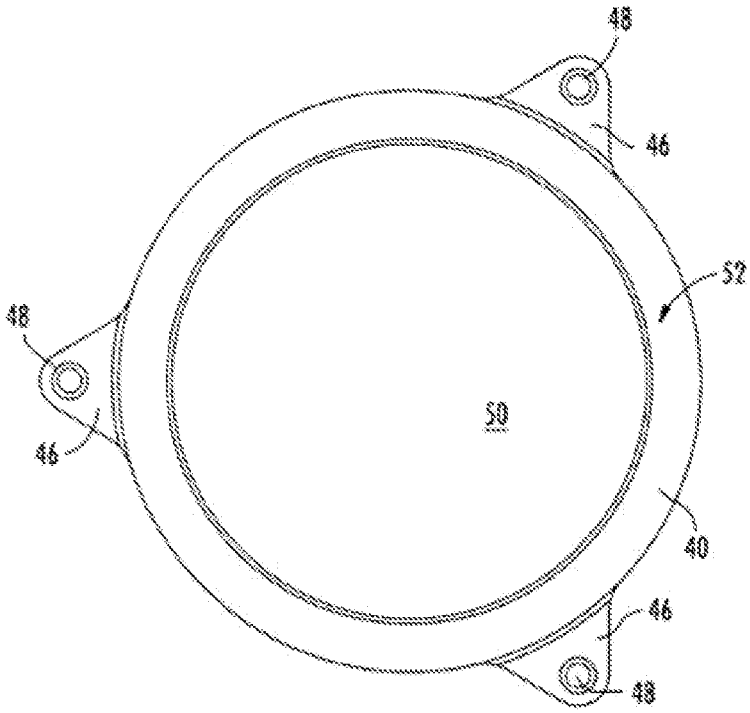

Fig. 9

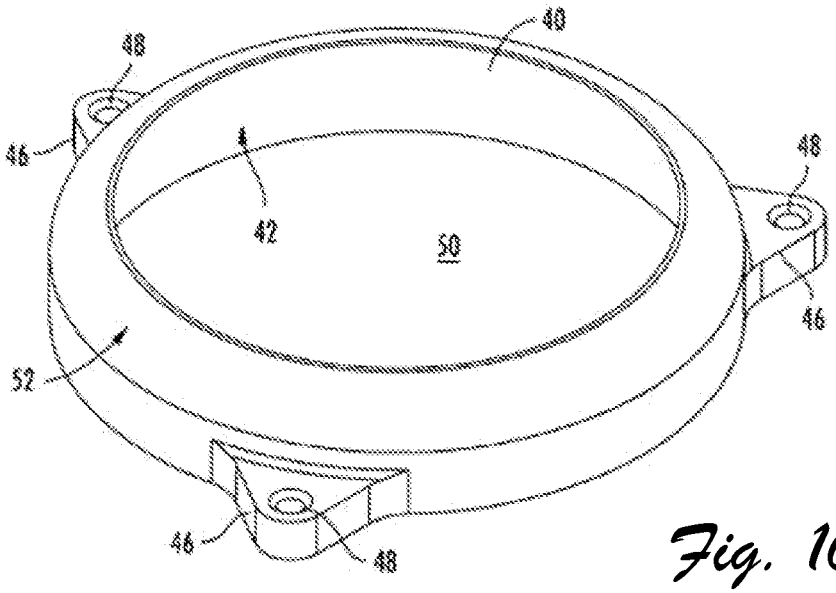

Fig. 10

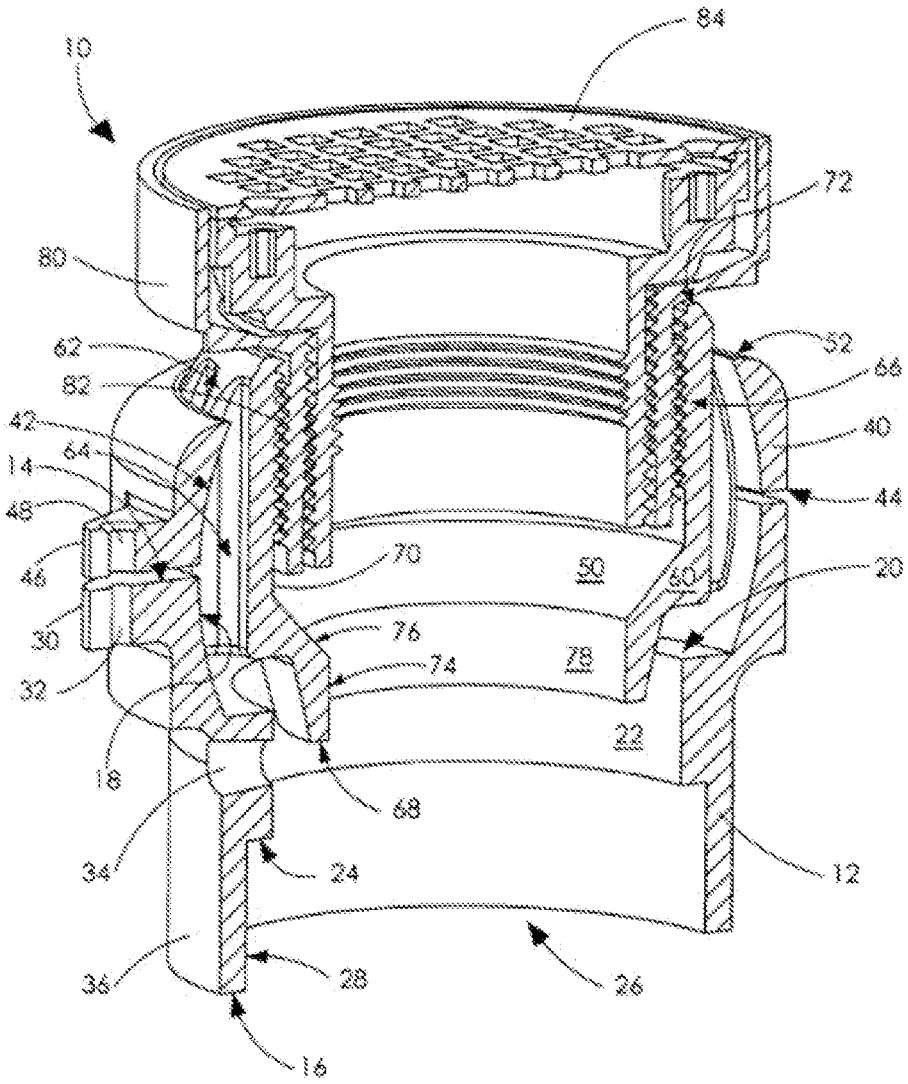
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Fig. 11

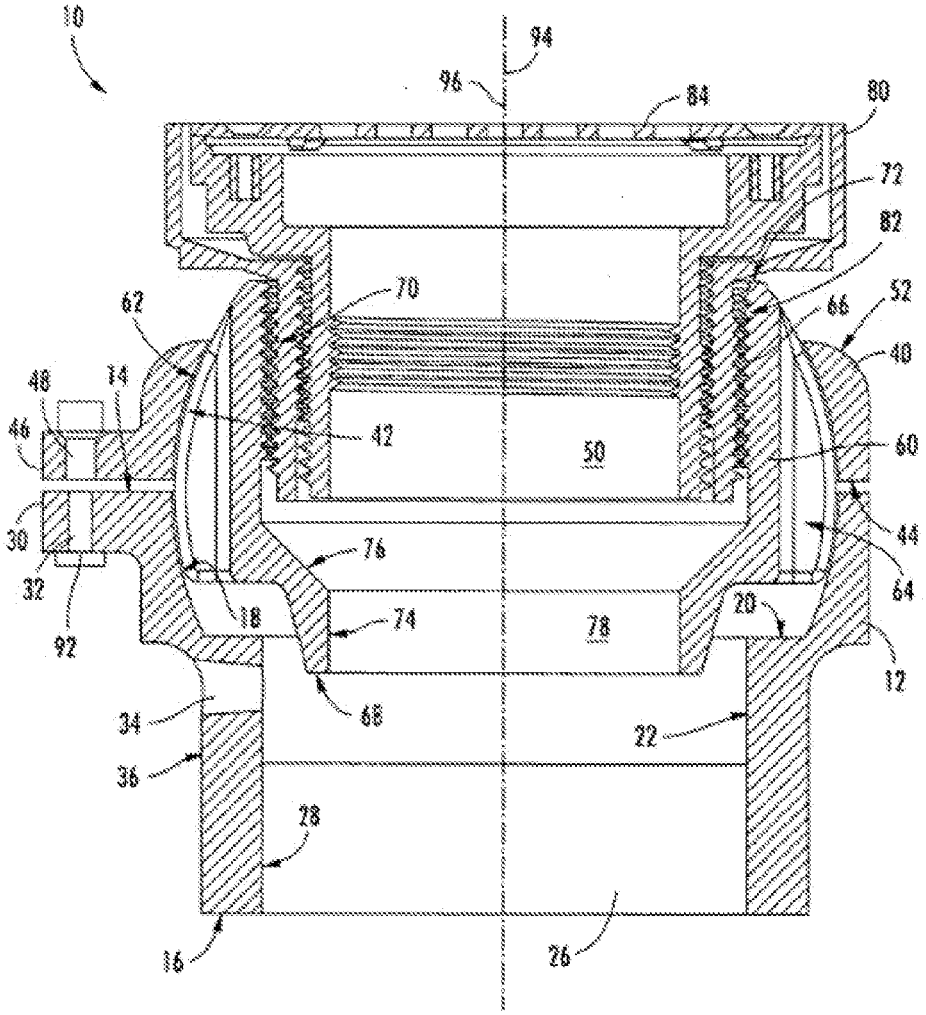
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Fig. 12

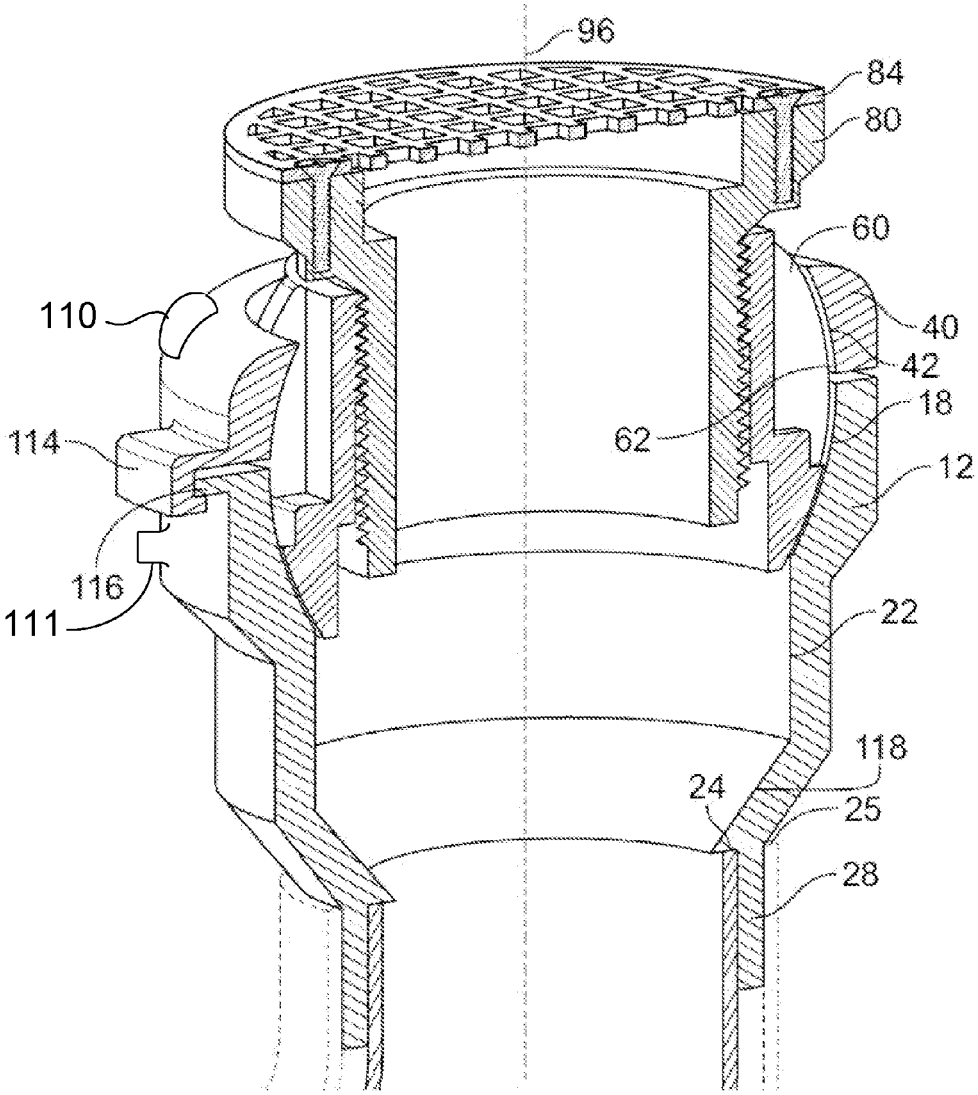

Fig. 14

ADJUSTABLE DRAIN ASSEMBLY

CLAIM OF PRIORITY

[0001] This application is a continuation in part of U.S. patent application Ser. No. 12/657,450 filed Jan. 21, 2010.

FIELD OF THE INVENTION

[0002] The present invention relates generally to an adjustable drain assembly. More particularly, the present application involves an adjustable drain assembly for use with waste water removal that can be adjusted so as to be flush with an upper surface of a floor for better drainage, appearance, and safety.

BACKGROUND

[0003] Floor drains are commonly found in locations such as bathrooms, basements, and showers for use in removing water that is either intentionally or unintentionally placed onto the surface that includes the floor drain. The drain generally includes a grate through which water and waste flows. An assembly attached to the grate is located below the floor and is itself attached to a pipe. The water and waste can flow through the grate and assembly and into the pipe for subsequent removal.

[0004] Plumbing codes generally require the pipe to be positioned at a certain angle so that water within the pipe may flow in the desired direction via gravity. The pipe usually takes the shape of an elbow at the drain location and placement of the pipe at the necessary angle thus causes the upper end of the pipe to be positioned at the same angle. Subsequent attachment of the grate and associated assembly to the pipe may cause the grate to be situated at an angle to the surface of the floor. A portion of the grate and/or assembly holding the grate may stick up from the surface of the floor or be located beneath the surface of the floor. Aside from creating an eyesore, this arrangement may present a tripping hazard to the occupants of the space or can cause damage by being snagged against shoes or socks.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] A full and enabling disclosure of the present invention, including the best mode thereof, directed to one of ordinary skill in the art, is set forth more particularly in the remainder of the specification, which makes reference to the appended Figs. in which:

[0006] FIG. **1** is a cross-sectional view of an adjustable drain assembly shown in relation to a concrete floor in accordance with one exemplary embodiment.

[0007] FIG. **2** is a cross-sectional view of an adjustable drain assembly in accordance with another exemplary embodiment.

[0008] FIG. **3** is a side view of the adjustable drain assembly of FIG. **2** shown in relation to a concrete floor.

[0009] FIG. **4** is a perspective view of the adjustable drain assembly of FIG. **2** shown in relation to a pipe.

[0010] FIG. **5** is a top view of a base of an adjustable drain assembly in accordance with one exemplary embodiment.

[0011] FIG. **6** is a perspective view of the base of FIG. **5**.

[0012] FIG. **7** is a top view of a pivot component of an adjustable drain assembly in accordance with one exemplary embodiment.

[0013] FIG. **8** is a perspective view of the pivot component of FIG. **7**.

[0014] FIG. **9** is a top view of an upper member of an adjustable drain assembly in accordance with one exemplary embodiment.

[0015] FIG. **10** is a perspective view of the upper member of FIG. **9**.

[0016] FIG. **11** is a cross-sectional view of the adjustable drain assembly shown in FIG. **2** without a locking bolt and rotated from the orientation shown in FIG. **2**.

[0017] FIG. **12** is a cross-sectional view of an adjustable drain assembly in accordance with another exemplary embodiment.

[0018] FIG. **13** is cross-sectional view of an adjustable drain assembly in accordance with another exemplary embodiment.

[0019] FIG. **14** is cross-sectional view of an adjustable drain assembly in accordance with another exemplary embodiment.

[0020] Repeat use of reference characters in the present specification and drawings is intended to represent the same or analogous features or elements of the invention.

DETAILED DESCRIPTION OF REPRESENTATIVE EMBODIMENTS

[0021] Reference will now be made in detail to embodiments of the invention, one or more examples of which are illustrated in the drawings. Each example is provided by way of explanation of the invention, and not meant as a limitation of the invention. For example, features illustrated or described as part of one embodiment can be used with another embodiment to yield still a third embodiment. It is intended that the present invention include these and other modifications and variations.

[0022] It is to be understood that the ranges mentioned herein include all ranges located within the prescribed range. As such, all ranges mentioned herein include all sub-ranges included in the mentioned ranges. For instance, a range from 100-200 also includes ranges from 110-150, 170-190, and 153-162. Further, all limits mentioned herein include all other limits included in the mentioned limits. For instance, a limit of up to 7 also includes a limit of up to 5, up to 3, and up to 4.5.

[0023] The present invention provides for an adjustable drain assembly **10** that can be used to align a grate **84** of a cover member **80** with the upper surface **88** of a concrete floor **86** to result in a safer and more visually pleasing arrangement. The adjustable drain assembly **10** may include a pivot component **60** housed within a base **12** and an upper member **40**. The pivot component **60** may have a convex outer pivoting surface **62** that engages concave inner pivoting surfaces **18** and **42** of the base **12** and upper member **40** to allow the pivot component **60** to pivot with respect to the base **12** and upper member **40**. The pivot component **60** can be adjusted so that the cover member **80** and grate **84** are moved to a desired position. A locking force may then be applied to the base **12** and upper member **40** to lock the position of the pivot component **60**, and hence cover member **80** and grate **84**, with respect to the base **12** and upper member **40**.

[0024] FIG. **1** illustrates one exemplary embodiment of the adjustable drain assembly **10** shown in relation to a concrete floor **86**. Installation of a drain into a floor of a residence or building may involve the placement of a pipe **90** at an angle to an upper surface **88** of a concrete floor **86** of the building. The pipe **90** may be placed at such an angle in order to ensure the flow of water through the pipe **90** for disposal. In one embodiment, the pipe is disposed inside the base and contacts inner

stop **24**. In one embodiment, pipe **90'** (of a larger diameter than pipe **90**) is disposed outside the base and contacts outer step **25**.

[0025] The adjustable drain assembly **10** facilitates an even placement of the cover member **80** with respect to the concrete floor **86** by including components that may be angled to one another. The pipe **90** may be rigidly connected to the bottom of a base **12**. A pivot component **60** can be locked onto the base **12** and angled thereto. As shown, an axis **94** passing through the center of the base **12** is oriented at an angle to an axis **96** passing through the center of the pivot component **60**. The cover member **80** can be attached to the pivot component **60** and can be properly positioned so that a grate **84** of the cover member **80** lays flush with the upper surface **88** of the concrete floor **86**.

[0026] In one embodiment, the drain assembly can be used for applications that include showers, sinks, pools, garages, patios and the like.

[0027] An alternative exemplary embodiment of the adjustable drain assembly **10** is shown in FIG. **2**. The drain assembly **10** includes a base **12**, upper member **40**, and pivot component **60**. A cover member **80** can be attached to the pivot component **60**. With reference now to FIGS. **2**, **5** and **6**, the base **12** defines a through bore **26** from a top surface **14** to a bottom surface **16**. A concave inner pivoting surface **18** can extend from the top surface **14** and may define a portion of the through bore **26**. The concave inner pivoting surface **18** can have a constant radius of curvature or may have a varying radius of curvature along its length. The concave inner pivoting surface **18** may be arranged so that the diameter of the portion of the through bore **26** formed by the concave inner pivoting surface **18** decreases in the direction extending away from the top surface **14** and at no point increases or remains the same along the entire length of the concave inner pivoting surface **18**. The concave inner pivoting surface **18** may terminate at an upper step **20** that can extend in a direction perpendicular to an axis **94** extending through the base **12**.

[0028] The base **12** may also include a pipe engagement surface **28** that can extend from the bottom surface **16**. In some arrangements, the pipe engagement surface **28** may be located on the inside of the base **12** and form a portion of the through bore **26**. In other embodiments, the pipe engagement surface **28** may be located along a portion of the outer side wall **36** of the base **12**. In still other arrangements, the pipe engagement surface **28** may be located at the bottom surface **16** and need not extend along the inner wall or outer side wall **36** of the base **12**. The pipe engagement surface **28** may be provided for engagement with the pipe **90**, although it is to be understood that portions of the pipe engagement surface **28** need not contact the pipe **90** when the pipe **90** is attached to the base **12**. However, in other arrangements, the entire pipe engagement surface **28** contacts the pipe **90** when the pipe **90** is attached to the base **12**.

[0029] In the embodiment illustrated, the pipe engagement surface **28** extends from the bottom surface **16** and defines a portion of the through bore **26** that has a constant diameter. The pipe engagement surface **28** terminates at a lower step **24** that extends towards the axis **94** and causes the diameter of the through bore **26** to be reduced in size at the lower step **24**. An inner surface **22** may extend from the lower step **24** to the upper step **20** and can be arranged so that it does not extend towards or away from the axis **94** and maintains the through bore **26** at a constant diameter. A flushing aperture **34** can extend from the outer side wall **36** of the base **12** to the through bore **26**. The flushing aperture **34** can penetrate the outer side wall **36** at the inner surface **22** so as to extend through the inner surface **22**. The flushing aperture **34** may be present in order to introduce water or other fluid into the drain assembly **10** and/or pipe **90**. Non-use of the drain may result in water present within the drain to dry up, thus allowing sewage gases from the sewer system to revert back through the drain and into the building to which the drain is installed. Water may be inserted through the flushing aperture **34** to maintain a sufficient water level in a trap used to act as a buffer to sewage gases. However, it is to be understood that other arrangements of the adjustable drain assembly **10** may be provided that do not include a flushing aperture **34**. Further, the flushing aperture **34** may be provided at a different location of the adjustable drain assembly **10** in other embodiments. In applications that do not involve water removal, a plug (not shown) may be inserted into the flushing aperture **34** to close off this opening if desired. Also, in applications involving the removal of waste water, the flushing aperture **34** can be unused if so desired and can be either closed off or left open.

[0030] The diameter of the through bore **26** may thus be varied along the length of the through bore **26** from the top surface **14** to the bottom surface **16**. In other arrangements, the through bore **26** may be formed completely by the concave inner pivoting surface **18** and the other portions of the base **12** forming the through bore **26** as illustrated need not be present. In these arrangements, the through bore **26** may have a completely varying diameter along its entire length. The pipe **90** may be arranged so that it is completely below certain portions of the adjustable drain assembly **10** such as the pivot component **60**, upper member **40**, and the cover member **40**. As such, no portion of the pivot component **60** may be capable of being inserted into the pipe **90** so as to be located within a through bore of the pipe **90**. The attached adjustable drain assembly **10** forms an opening through which water or other waste material may flow through a grate **84** and through the interior of the adjustable drain assembly **10** and into the interior of the pipe **90** and then transported to a desired location. It is to be understood, however, that other arrangements are possible in which one or more of the components of the adjustable drain assembly **10** such as the pivot component **60**, upper member **40**, and/or cover member **80** are capable of being inserted into the pipe **90**. As such, other arrangements are possible in which one or more of the components are not located completely above the pipe **90**. In still other arrangements, the adjustable drain assembly **10** may be made so that the various components can touch the drain **90** but not be located within the drain **90**.

[0031] FIG. **12** illustrates an alternative exemplary embodiment of the adjustable drain assembly **10** in which the base **12** includes a pipe engagement surface **28** that extends from the bottom surface **16**. A portion of the through bore **26** is defined by the concave inner pivoting surface **18** that ends at an upper step **20** that extends in a direction perpendicular to the axis **94** of the base **12**. The concave inner pivoting surface **18** and the upper step **20** may be arranged as previously described. The pipe engagement surface **28** defines a portion of the through bore **26** from the bottom surface **16** to the upper step **20** such that this portion of the through bore **26** has a constant diameter. As such, the lower step **24** and the inner surface **22** of the previously described embodiment are not present. The pipe **90** may be attached to the base **12** and can engage the entire

length of the pipe engagement surface **28** or may engage only a portion of the length of the pipe engagement surface **28**.

[0032] With reference now back to FIGS. **2**, **5** and **6**, the portion of the base **12** that defines the concave inner pivoting surface **18** may be integrally formed with the portion of the base **12** that defines the pipe engagement surface **28** so that these portions are a single piece. In this manner, the base **12** can be a single piece and not multiple pieces formed together that form the concave inner pivoting surface **18** and the pipe engagement surface **28**. The portions of the base **12** as shown in the figures may be a single, integrally formed piece. However, other arrangements may exist in which multiple separate pieces are combined together so as to form the concave inner pivoting surface **18** and the pipe engagement surface **28** of the base **12**.

[0033] The base **12** may include one or more flanges **30** positioned an equal distance about the perimeter of the base **12**. Any number of flanges **30** may be included. For example from 1-3, from 2-5, or up to 10 flanges **30** may be present in other arrangements. As illustrated, three flanges **12** are present and each includes a flange aperture **32** extending therethrough. The flanges **30** and flange apertures **32** are used for engagement with an upper member **40** so that a locking bolt **92** can be disposed therethrough for use in providing a locking force to the adjustable drain assembly **10**. However, other embodiments are possible in which flanges **30** and locking bolts **92** are not used to generate a locking force of the adjustable drain assembly **10**. For example, set screws, a friction fit, mechanical fasteners, or interlocking components can be used to effect locking of the adjustable drain assembly **10**.

[0034] Referring now to FIGS. **2**, **9** and **10**, the adjustable drain assembly **10** includes an upper member **40** that has a bottom surface **44** that may directly face the top surface **14** of the base **12**. The bottom surface **44** may be spaced from the top surface **14** or may in fact engage the top surface **14** in certain arrangements. The top surface **14** and bottom surface **44** may both be flat surfaces or may be variously shaped in other arrangements. The upper member **40** may include one or more flanges **46** that can coincide with the flanges **30** of the base **12**. Any number of flanges **46** may be present in various arrangements such as from 1-3, from 2-5, or up to 10 flanges. The flanges **46** can each include a flange aperture **48** that align with respective flange apertures **32** of the flanges **30**. A locking bolt **92** can be disposed through both the flange aperture **32** and the flange aperture **48** and tightened in order to urge the top surface **14** of the base **12** and the bottom surface **44** of the upper member **40** towards one another so as to effect locking of the adjustable drain assembly **10**. As previously discussed, the use of flanges **46** and locking bolts **92** need not be present in other arrangements in order to effect locking of the adjustable drain assembly **10**.

[0035] The upper member **40** defines a through bore **50** that extends from a top surface **52** to the bottom surface **44**. The upper member **40** also has a concave inner pivoting surface **42** that may define the entire through bore **50**. In other arrangements, the concave inner pivoting surface **42** may define only a portion of the through bore **50** and other portions of the upper member **40** can define the rest of the through bore **50**. The concave inner pivoting surface **42** can be arranged so that the through bore **50** increases in diameter along the entire length of the through bore **50** from the top surface **52** to the bottom surface **44**. In this regard, the concave inner pivoting surface **42** constantly changes along its entire length so that the through bore **50** does not have a constant diameter at any location. The radius of curvature of the concave inner pivoting surface **42** may be constant along its entire length, or various radii of curvature of the concave inner pivoting surface **42** may exist along its length. Further, the radius of curvature of the concave inner pivoting surface **42** may be the same as, or different from, the radius of curvature of the concave inner pivoting surface **18** of the base **12**.

[0036] The upper member **40** can have a top surface **52** that is convex in shape. The top surface **52** can be differently shaped than the bottom surface **44**, or may be the same shape as the bottom surface **44** in other embodiments. The top surface **52** can be arranged so that the upper member **40** cannot be flipped upside down so to make the top surface **52** directly face the top surface **14** of the base **12**. However, other arrangements are possible in which the upper member **40** may be capable of being flipped upside down so as to face the top surface **14**. For example, the top surface **52** need not be convex in shape but can have flat sections that extend around the entire circumference. In these alternate embodiments, the top surface **52** generally forms an apex in which a portion of the top surface **52** extends away from the concave inner pivoting surface **42**. In other arrangements, the top surface **52** may be flat.

[0037] With reference now to FIGS. **2**, **7** and **8**, the adjusting drain assembly **10** includes a pivot component **60** that has a convex outer pivoting surface **62**. A number of recesses **64** are defined in the convex outer pivoting surface **62** and extend generally along the length of the pivot component **60** so as to be roughly aligned with the axis **96** of the pivot component **60**. The convex outer pivoting surface **62** may have a single, constant radius of curvature or may have varying radii of curvature in other exemplary embodiments. The radius of curvature of the convex outer pivoting surface **62** may be the same as the radii of curvature of the concave inner pivoting surfaces **18** and **42**. As such, the convex outer pivoting surface **62** may be complimentary to the concave inner pivoting surfaces **18** and **42** so as to be capable of engaging these surfaces **18** and **42**. The user may adjust the position of the pivot component **60** with respect to the upper member **40** and the base **12**. The geometry of the pivot component **60** may function to limit the range of adjustment of the pivot component **60**. For example, the portion of the pivot component **60** at the bottom of the convex outer pivoting surface **62** may extend inwards towards the axis **96** and may abut against the upper step **20** so as to prevent further pivoting of the pivot component **60**. This may be illustrated with reference back to FIG. **1** in which the pivot component **60** abuts against the upper step **20**. Also, as illustrated with reference to FIG. **1**, the pivot component **60** need not have any recesses **64** located thereon. Although shown as extending completely around the axis **94** of the pivot component **60**, in other arrangements the recesses **64** may extend up to 90°, up to 180°, or up to 270° around the convex outer pivoting surface **62** of the pivot component **60**. The recesses **64** may function to reduce the weight of the pivot component **60** and hence reduce the cost of material in manufacturing this portion of the adjustable drain assembly **10**.

[0038] Referring back to FIGS. **2**, **7** and **8**, the convex outer pivoting surface **62** extends completely around the outer circumference of the pivot component **60**. In other arrangements, the convex outer pivoting surface **62** need not extend completely around the entire outer surface of the pivot component **60**. In this regard, a portion of the outer surface of the pivot component **60** need not be convex in shape. The convex

outer pivoting surface **62** may engage the concave inner pivoting surfaces **18** and **42** but can slide across these surfaces so that the angle of the axis **96** of the pivot component **60** can be adjusted relative to the axis **94** of the aligned base **12** and upper member **40**. The engagement may also allow for the pivot component **60** to be able to be spun around on its axis **96** a complete 360°. Once the pivot component **60** has been oriented to a desired position relative to the base **12** and the upper member **40**, the locking bolts **92** can be tightened in order to exert a force urging the base **12** and the upper member **40** towards one another. This force will be translated to the concave inner pivoting surfaces **18** and **42** that will be moved against the convex outer pivoting surface **62** in order to pin the convex outer pivoting surface **62** into the desired position. Repeated tightening of the locking bolts **92** will cause the convex outer pivoting surface **62** to be tightly engaged between the concave inner pivoting surfaces **28** and **42** and held securely into position.

[0039] The convex outer pivoting surface **62** extends from the top surface **72** of the pivot component **60** and terminates at a location above the bottom surface **68** so as not to extend all the way to the bottom surface **68**. In other arrangements, the convex outer pivoting surface **62** can extend upwards from the bottom surface **68** and terminate at a location short of the top surface **72**. In yet other exemplary embodiments, the convex outer pivoting surface **62** may extend the entire length from the top surface **72** to the bottom surface **68**. The pivot component **60** defines a through bore **78** that extends from the top surface **72** to the bottom surface **68**. A first inner surface **70** can extend from the top surface **72** and may form a portion of the through bore **78**. The first inner surface **70** may have internal threading **66** defined thereon and, with the exception of the internal threading **66**, can form a portion of the through bore **78** that has a constant diameter. A sloped surface **76** can extend from the bottom of the first inner surface **70** and may be directed so as to cause the portion of the through bore **78** formed by the sloped surface **76** to decrease in diameter in the direction extending away from the first inner surface **70** along the axis **96**. The sloped surface **76** may have a constant degree of slope or may have various degrees in different embodiments. A second inner surface **74** may be defined from the bottom of the sloped surface **76** to the bottom surface **68** and can form a portion of the through bore **78** that has a constant diameter. The bottom surface **68** may be located in the portion of the through bore **26** formed by the inner surface **22** of the base **12**. In other arrangements when pivoted, the bottom surface **68** may be located in the portions of the through bore **26** formed by both the inner surface **22** and the concave inner pivoting surface **18** of the base **12**. For example, in an alternative arrangement of the adjustable drain assembly **10** the pivot component **60** includes a through bore **78** defined by a first inner surface **70** and a sloped surface **76** that extends from a top surface **72** to a bottom surface **68**. The slope surface **76** can be arranged so that it extends from the bottom surface **68** to the first inner surface **70**, and a second inner surface **74** need not be present.

[0040] Referring back to FIGS. **2**, **7** and **8**, the pivot component **60** may be arranged so that the pivot component **60** is located along the entire length of the through bore **50** of the upper member **40**. Further, the pivot component **60** may extend along a portion of the length of the through bore **26** of the base **12**. In other embodiments, the pivot component **60** may extend along the entire length of the through bore **26** of the base **12** and may extend along the entire length of the through bore **26** of the base **12**. In yet further arrangements, the pivot component **60** may be located in and extend along the entire length of the through bore **26** of the base **12**, and the pivot component **60** may be located in and extend through only a portion of the through bore **50** of the upper member **40** and not through the entire length of the through bore **50**.

[0041] A cover member **80** can be attached to the pivot component **60** and can have an axis that aligns with the axis **96** of the pivot component **60** so that positioning of the pivot component **60** effects positioning of the cover member **80**. The cover member **80** can be a separately purchased component or may be supplied with and form a part of the adjustable drain assembly **10** upon purchase. The cover member **80** may include a through bore and have external threading **82** that engages the complimentary internal threading **66** of the pivot component **60** so as to effect attachment. A grate **84** may be located at the top of the cover member **80**. The user may turn the cover member **80** to move the cover member **80** due to the treaded connection between the cover member **80** and the pivot component **60**. The height of the grate **84** may thus be raised and lowered with respect to the pivot component **60**, upper member **40**, and base **12**. The cover member **80** illustrated in the exemplary embodiment includes a second set of threaded members that allows for additional adjustment of the height of the cover member **80** should the adjustments provided by the external threading **82** and internal threading **66** not be sufficient. The cover member **80** may be variously configured in accordance with different exemplary embodiments and a variety of types of cover members can be attached to the adjustable drain assembly **10**. The cover member **80** may be a clean out or a cover plate in accordance with different exemplary embodiments.

[0042] One exemplary embodiment of the installation of the adjustable drain assembly **10** may first include the installation of the pipe **90** out of the ground at a desired drainage pitch angle. A string line may be placed that represents the final level of a cement floor **86** that is to be subsequently poured. The installer may place the adjustable drain assembly **10** onto the top of the pipe **90** and install same thereon. For example, the top of the pipe **90** may be press fit onto the pipe engagement surface **28**. Other arrangements are possible in which the engagement between the pipe **90** and the base **12** may be effected through a threaded engagement, mechanical fasteners, or snap-in locking. Plumber's tape may be used to ensure this connection remains leak proof if desired. The installer can then adjust the angular orientation of the pivot component **60** and attached cover member **80** so that a grate **84** of the cover member **80** is level with the string line. The height of the cover member **80** with respect to the pivot component **60** can be adjusted as needed through the threaded engagement between internal threading **66** and external threading **82** so that the grate **84** is located at the sting line. Once the installer is satisfied with the position of the grate **84**, he or she may tighten the locking bolts **92** so as to lock the angular orientation of the grate **84** and attached cover member **80** and pivot component **60**. A water line may be attached to the flushing aperture **34** either before or after positioning of the grate **84** is accomplished.

[0043] The concrete slab may be poured around the adjustable drain assembly **10** in order to form the concrete floor **86**. The rigid interlocking of the adjustable drain assembly **10** will prevent this component and the attached grate **84** from being moved out of position when subjected to forces applied by the cement. FIG. **3** illustrates one exemplary embodiment

in which recesses **64** are located on the pivot component **60**. Concrete may enter the recesses **64** when poured to form the concrete floor **86**. Hardening of concrete within the recesses **64** may further function to more securely anchor the adjustable drain assembly **10** into the concrete floor **86**.

[0044] With reference now to the exemplary embodiment of FIG. **1**, the adjustable drain assembly **10** is shown in relation to a concrete floor **86**. As shown, the pivot component **60**, cover member **80**, and the grate **84** are pivoted in relation to the pipe **90**, base **12** and upper member **40** so that the top of the grate **84** is flush with the upper surface **88** of the concrete floor **86**. This positioning may eliminate the grate **84** or other portion of the cover member **80** as a tripping hazard since they are not flush with the upper surface **88**. Also, this arrangement may prevent the accumulation of water or debris and resultant bacteria that will now go down the drain instead of being located outside of or at the grate **84** due to its positioning. Further, the arrangement may function to stabilize the line connected to the flushing aperture **34** as it may likewise be encased in concrete. The exemplary embodiment of FIG. **1** does not include recesses **64**. However, the adjustable drain assembly **10** may still be securely held within the concrete floor **86** by having the concrete poured around the various components of the adjustable drain assembly **10**. Further, although shown and described as being used in conjunction with a concrete floor **86**, the adjustable drain assembly **10** may be used with other types of floors such as wood floors in accordance with other exemplary embodiments. Also, although described as being used in connection with water in a plumbing application, the adjustable drain assembly **10** may be used in other applications. For instance, the adjustable drain assembly **10** may be used in conjunction with an electrical conduit for use in housing electrical components such as wire or cable.

[0045] Referring to FIG. **13**, another embodiments of the present invention is shown. Upper member **40** can include an upper tab **110** and lower tab **111** (FIG. **14**) that can assist with tightening the bayonet friction coupling between upper member **40** and base **12**. The bayonet friction coupling can be defined with a locking tab **116** included in the base which engaged a slot **114** defined in the upper member so that when the upper member is rotated the locking tab, being angled, causes the upper member to compress against pivot component **60**. In one embodiment, a detent can be included in a locking assembly comprising the friction coupling so that the upper member and base are locked in place.

[0046] Lower step **24** (or inner step) extends into through bore **96** and in included in the base. An outer step **25** can be included in the base extending aware from the through bore and disposed external to the base. The inner surface **22** can extend from the concave surface **18** of base **12** downward to shelf **118**. Shelf **118** can be disposed between the inner surface and the lower step. In one embodiment the inner surface is sloped inwards from the top to the bottom. Cover member **80** can be extendable attached to pivot component **60** so that when the base is attached to pipe **90**, the cover member can be extended upward or downward so that the grate **84** is flush with the floor.

[0047] While the present invention has been described in connection with certain preferred embodiments, it is to be understood that the subject matter encompassed by way of the present invention is not to be limited to those specific embodiments. On the contrary, it is intended for the subject matter of the invention to include all alternatives, modifications and equivalents as can be included within the spirit and scope of the following claims.

What is claimed is:

1. An adjustable drain assembly, comprising:

a base having a concave inner pivoting surface, wherein said base has a top surface;

an upper member having a bottom surface that is located above the top surface of the base, wherein the upper member has a concave inner pivoting surface;

a pivot component having a convex outer pivoting surface that engages the concave inner pivoting surface of the base and that engages the concave inner pivoting surface of the upper member, wherein the pivot component is configured for engagement with a cover member;

a pipe engagement surface included in the base for engagement with a pipe wherein the pipe is located completely below the pivot component; and,

a lower step included in the base disposed between the pipe engagement surface and the concave inner pivot surface.

2. The adjustable drain assembly of claim **1** including an inner surface extending from the concave inner pivoting surface and disposed above the pipe engagement surface.

3. The adjustable drain assembly of claim **2** wherein the inner surface extending from the concave inner pivoting surface is sloped inward.

4. The adjustable drain assembly of claim **2** including a shelf extending from the inner surface.

5. The adjustable drain assembly of claim **1** wherein said cover member is adjustably attached to said upper member so that the distance between the top of the cover member and the top of the upper member can be varied.

6. The adjustable drain assembly of claim **1** wherein at least a portion of the pivot component includes recesses.

7. The adjustable drain assembly of claim **1** wherein said lower step is an outward lower step.

8. The drain assembly of claim **1** wherein said upper member and said lower member are removable connected by a bayonet friction coupling.

9. An adjustable drain assembly, comprising:

a base having a concave inner pivoting surface that defines a portion of a through bore of the base, wherein the through bore of the base extends from a top surface of the base to a bottom surface of the base, wherein the concave inner pivoting surface extends from the top surface of the base to a location that is not at the bottom surface of the base, wherein the portion of the base defining the concave inner pivoting surface and the portion of the base defining the through bore from the concave inner pivoting surface to the bottom surface of the base are a single component;

an upper member that has a concave inner pivoting surface, wherein the upper member has a through bore;

a pivot component whose position can be adjusted relative to the base and the upper member, wherein the pivot component has a convex outer pivoting surface, wherein at least a portion of the pivot component is located in the through bore of the upper member, wherein the position of the pivot component can be adjusted relative to the base and the upper member to a desired position and then can be locked into place so as to have a fixed position relative to the base and the upper member; and,

a pipe engagement surface that extends from the bottom surface of the base to a lower step that defines a portion of the through bore of the base and is configured for engagement with a pipe.

10. The adjustable drain assembly of claim **9** wherein the lower step extends from the through bore through the base extending away from the outer surface of the base.

11. The adjustable drain assembly of claim **9** including an inner surface extending from the concave inner pivoting surface and disposed above the pipe engagement surface.

12. The adjustable drain assembly of claim **11** wherein the inner surface extending from the concave inner pivoting surface is sloped.

13. The adjustable drain assembly of claim **11** including a shelf extending from the inner surface.

14. The adjustable drain assembly of claim **11** including a shelf extending into the through bore and carried by an inner surface of the base.

15. An adjustable drain assembly, comprising:

a base having a concave inner pivoting surface and a through bore;

a pipe engagement surface included in the base and disposed under the concave inner pivoting surface for attaching a pipe to the base;

an inner step included in the base extended into the through bore;

an upper member that has a concave inner pivoting surface removably attached to the base; and,

a pivot component having a convex outer pivoting surface whose position can be adjusted relative to the base and the upper member and then can be locked into place so as to have a fixed position relative to the base and the upper member.

16. The adjustable drain assembly of claim **15** including an outer step included in the base extending away from the through bore.

17. The adjustable drain assembly of claim **15** including a cover member removably attached to the pivot component and extendable away from the pivot component to vary the distance between the bottom of the base and the top of the cover component.

18. The adjustable drain assembly of claim **15** including a bayonet friction coupling for locking the base and the upper member and securing the pivot component in a desired position.

19. The adjustable drain assembly of claim **18** including an upper tab included in the upper member to assist with rotating the upper member relative to the base to lock the upper member and base together.

20. The adjustable drain assembly of claim **18** including a lower tab included in the base to assist with rotating the upper member relative to the base to lock the upper member and base together.

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