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Pilarczyk et al.

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(54) **SHOWER DRAIN AND PROTECTIVE COVER**

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Related U.S. Application Data

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(51) **Int. Cl.**
E03C 1/22 (2006.01)
E03C 1/264 (2006.01)

(52) **U.S. Cl.**
CPC ***E03C 1/22*** (2013.01); *E03C 1/264* (2013.01)

(58) **Field of Classification Search**
CPC .. E03C 1/22; E03C 1/262; E03C 1/264; E03F 5/0408; F16L 2101/30; F16L 55/1157; F16L 57/005
See application file for complete search history.

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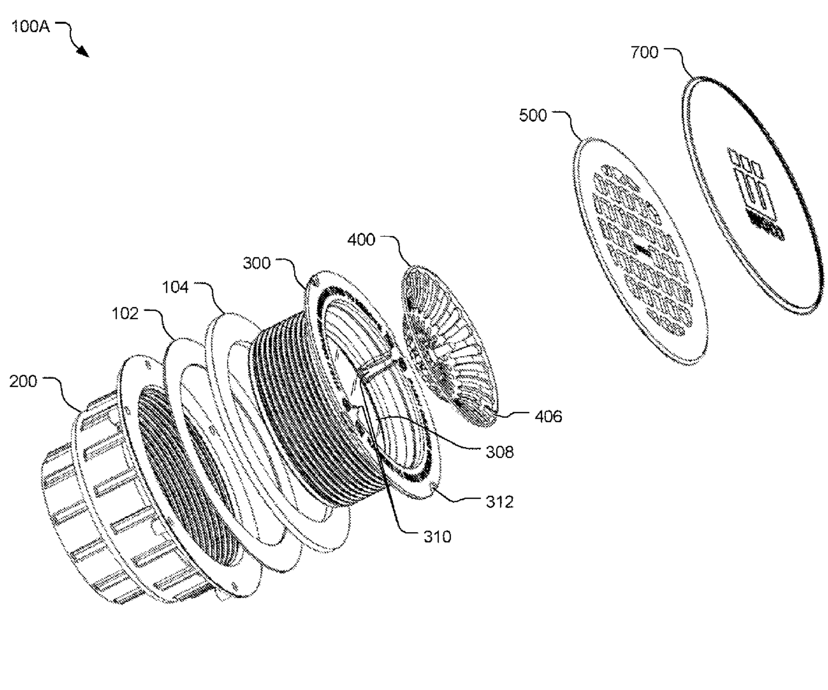
Assistant Examiner — Nicholas A Ros

(57) **ABSTRACT**

Shower drain assemblies and their components are disclosed. In examples, a shower drain assembly may include a receptor, a threaded flange, a plate, and a protective cover. The protective cover may protect the plate, the threaded flange, or other components from damage. The protective cover may be installed directly onto the threaded flange or onto the plate when the plate is installed onto the threaded flange. The same protective cover can thus be used to protect shower drain assemblies at different stages of installation—whether or not trim pieces such as the plate have yet been installed.

15 Claims, 13 Drawing Sheets



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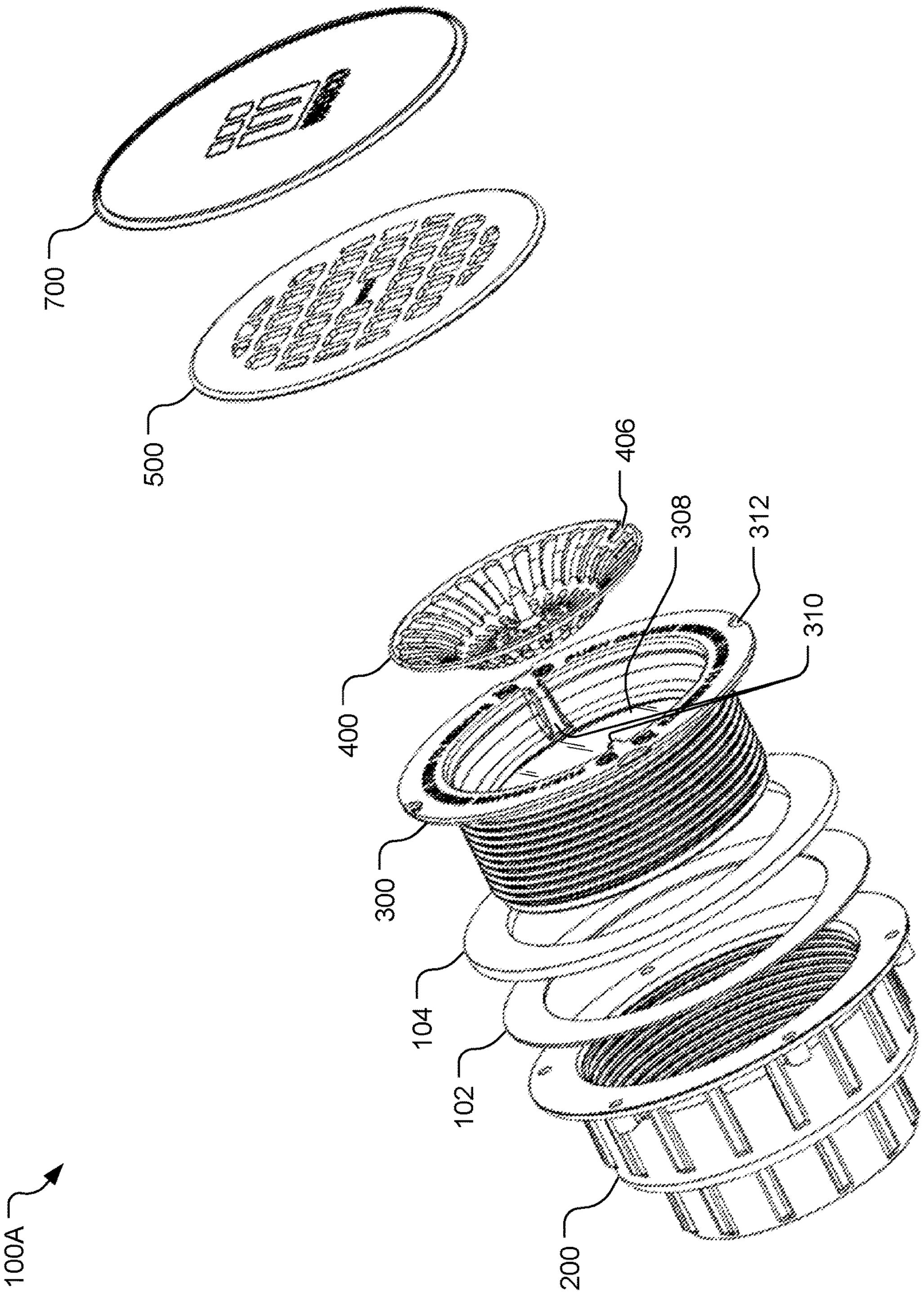

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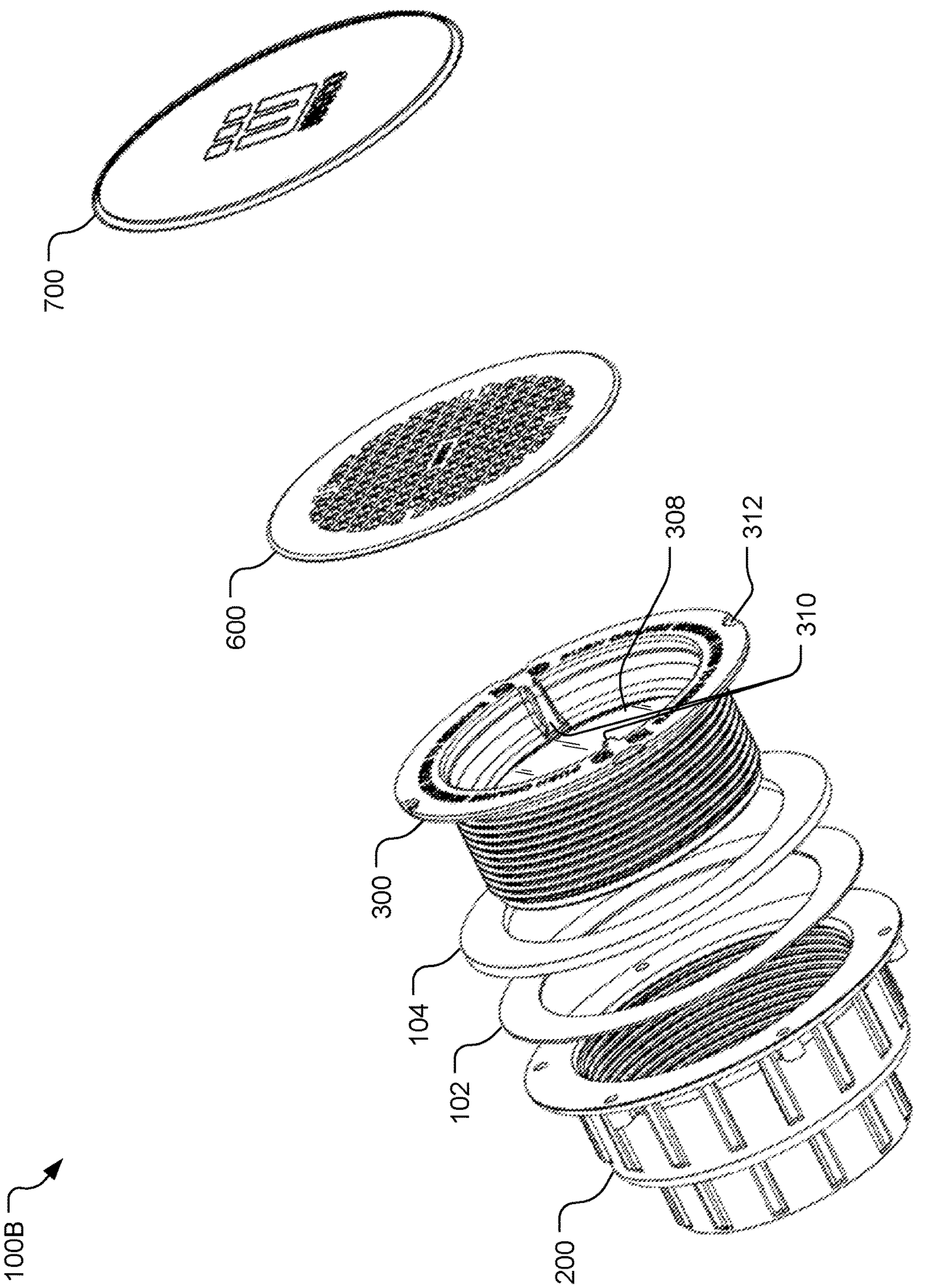


FIG. 1B

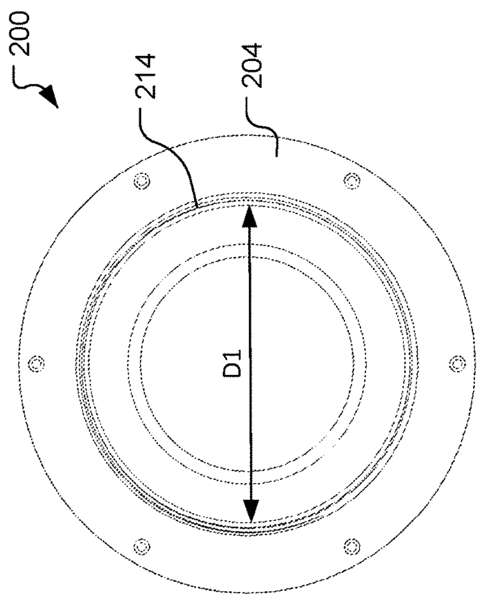


FIG. 2C

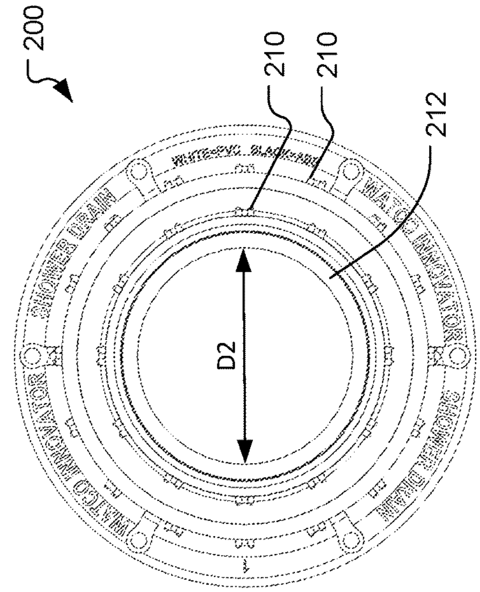


FIG. 2D

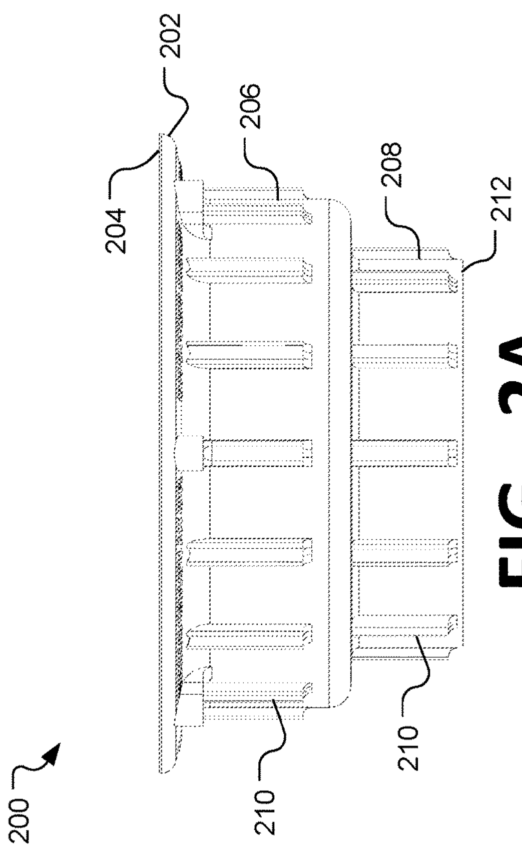


FIG. 2A

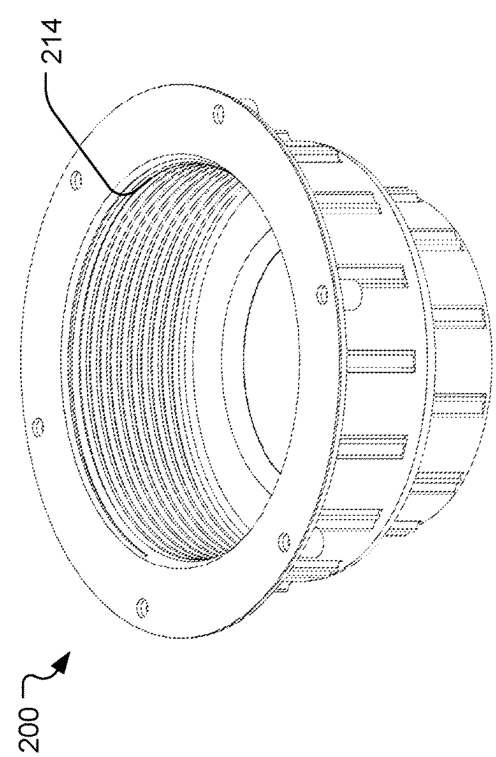


FIG. 2B

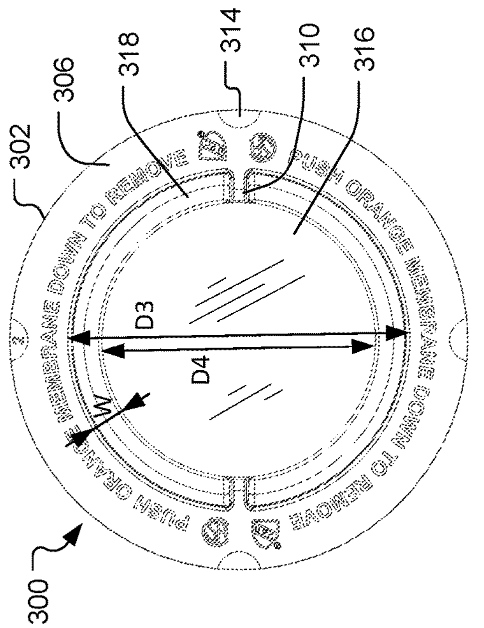


FIG. 3C

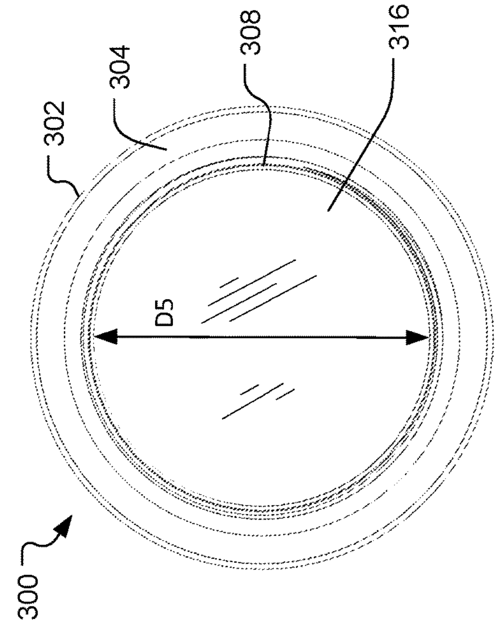


FIG. 3D

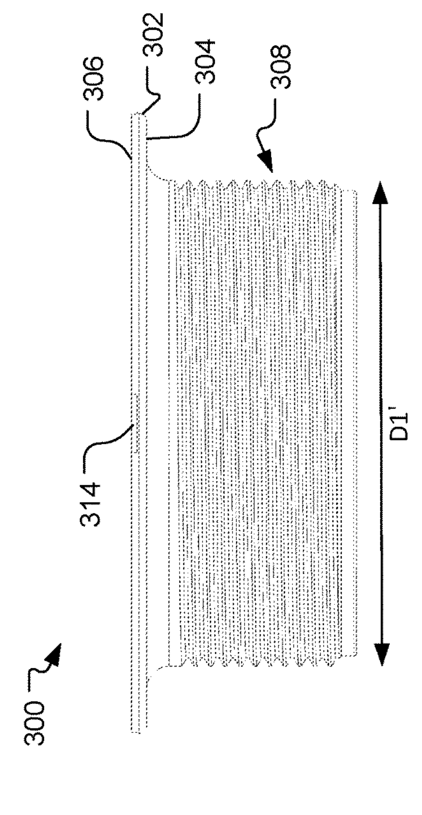


FIG. 3A

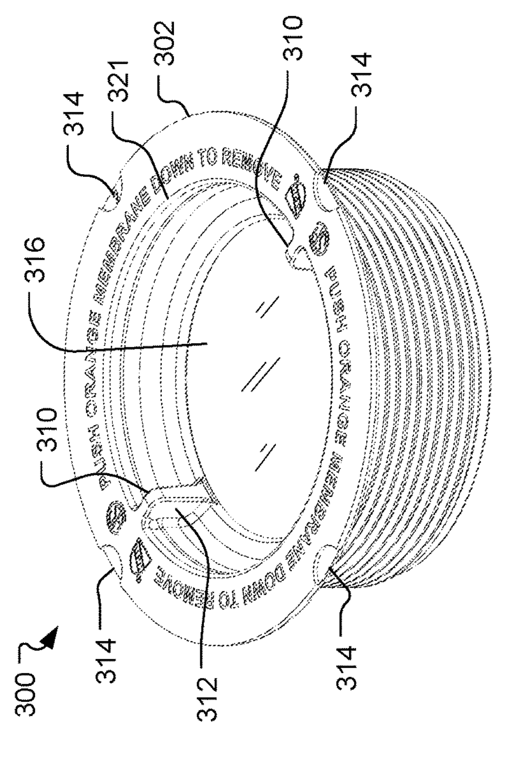


FIG. 3B

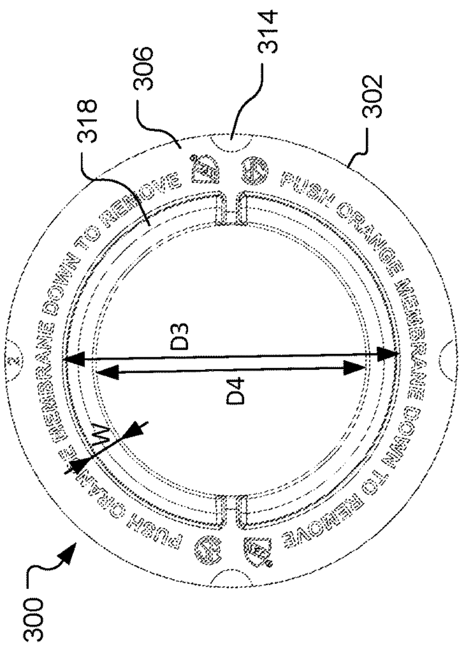


FIG. 3F

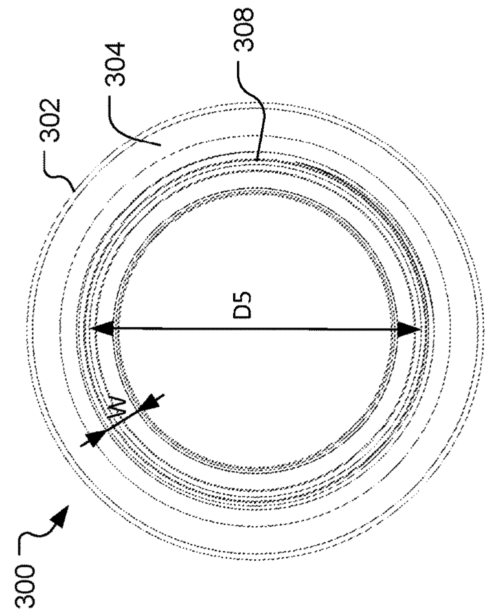


FIG. 3G

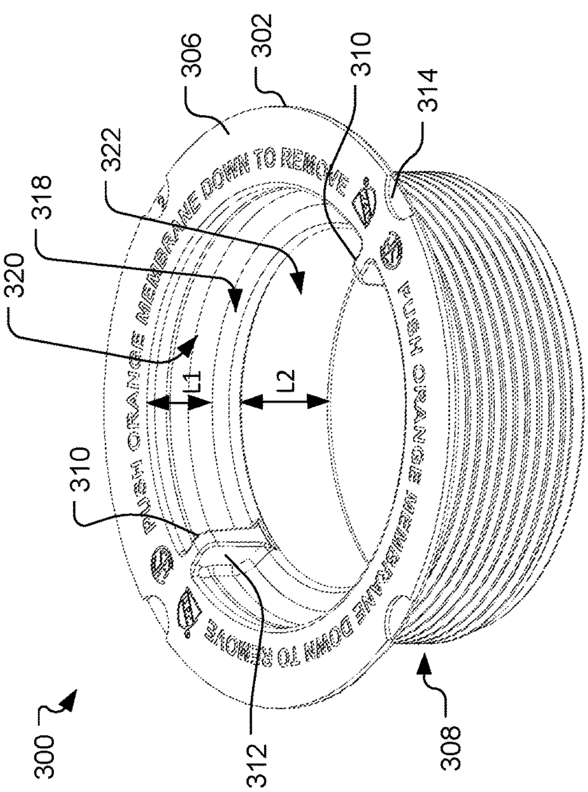
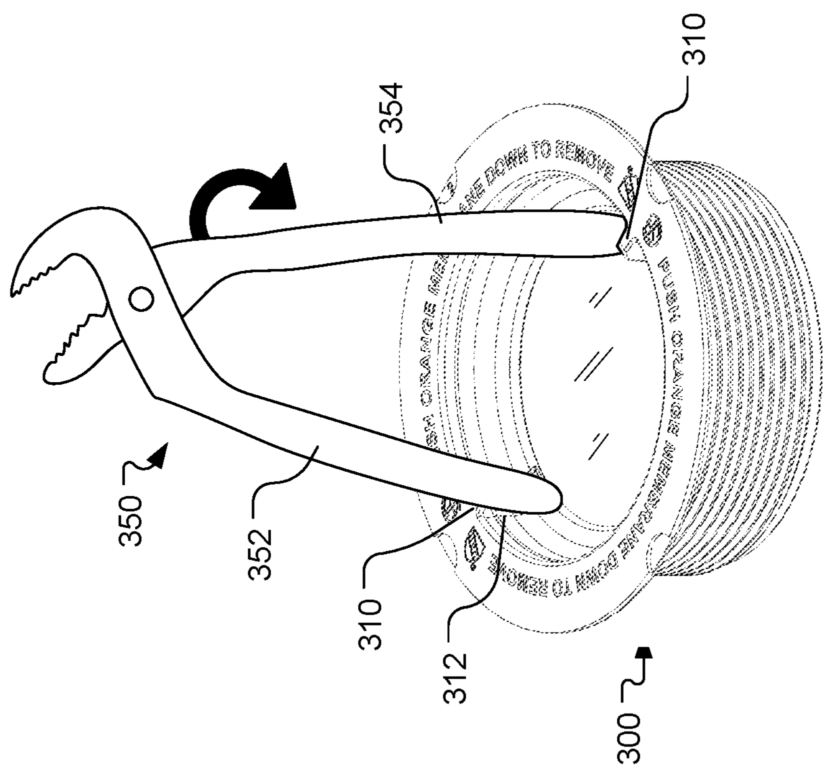


FIG. 3E



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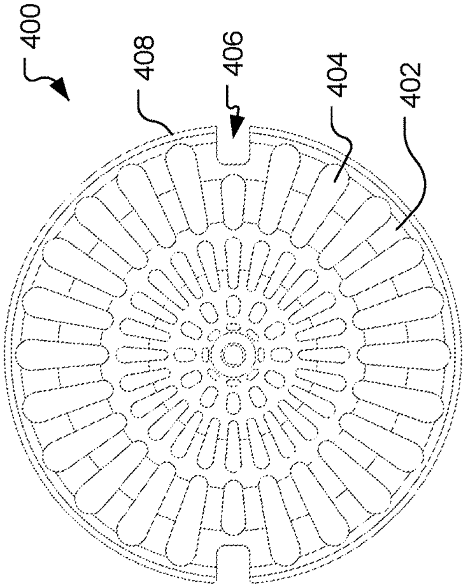

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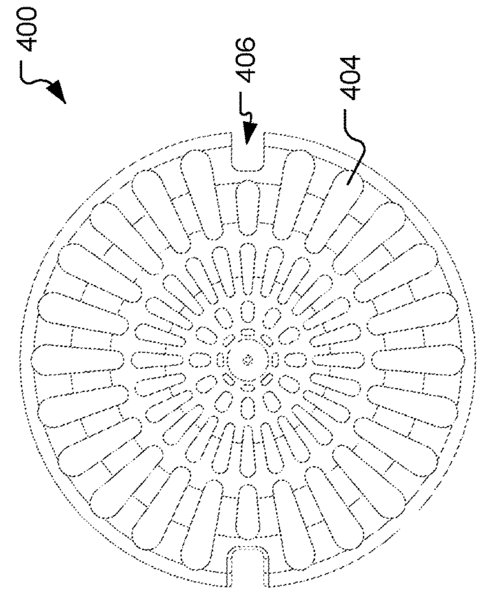


FIG. 4D

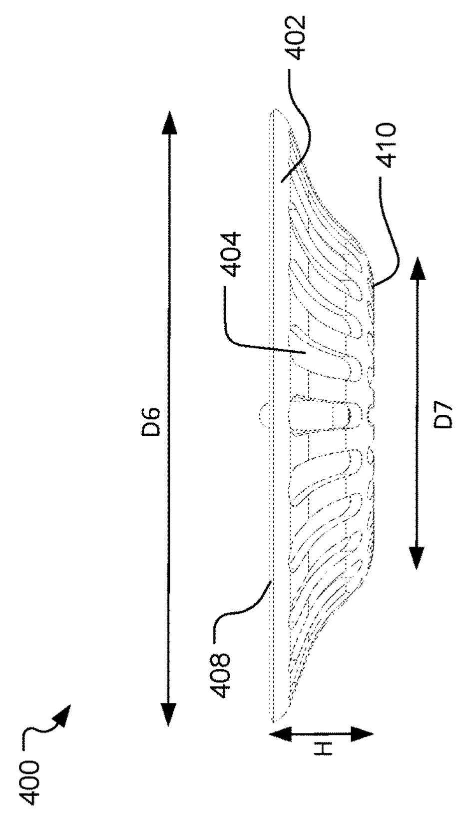


FIG. 4A

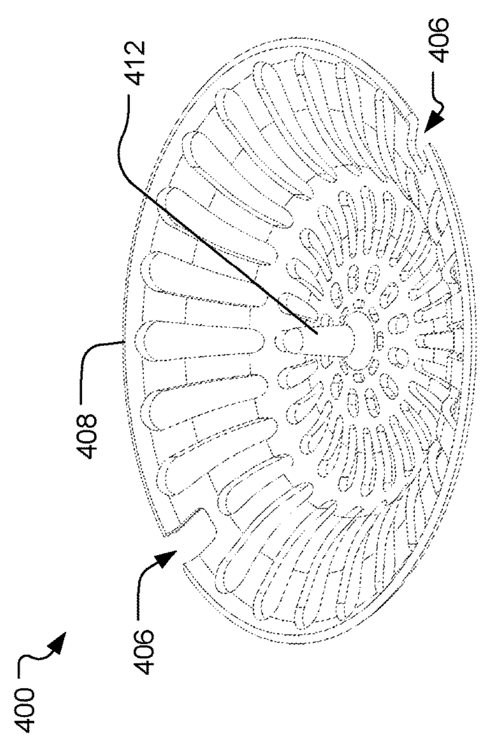
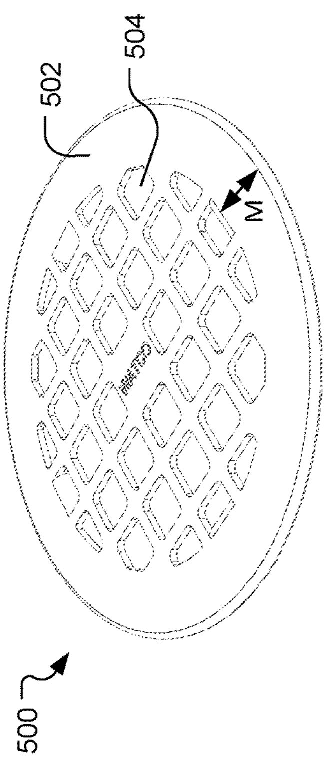


FIG. 4B



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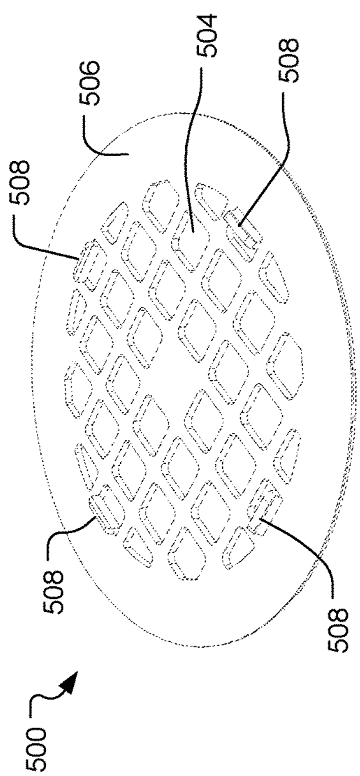
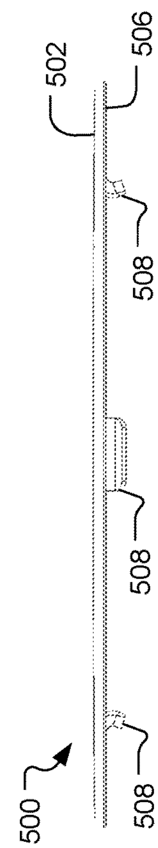


FIG. 5B



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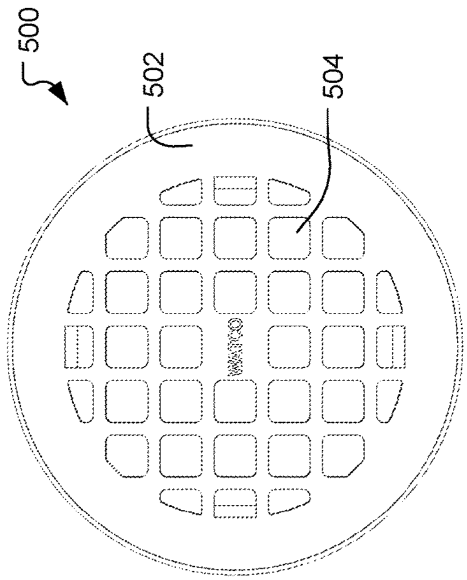
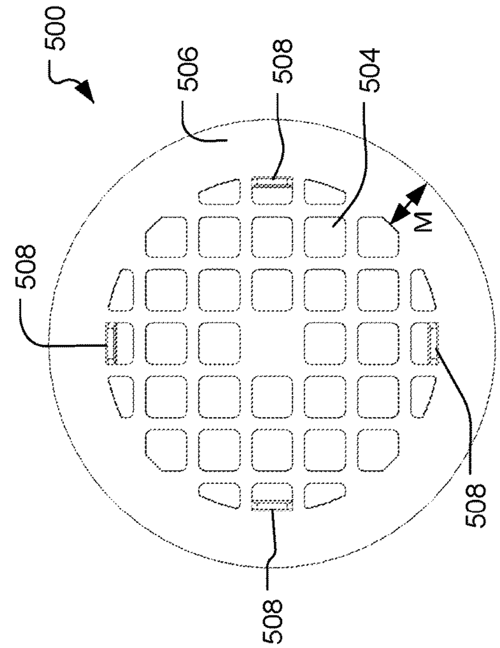


FIG. 5D



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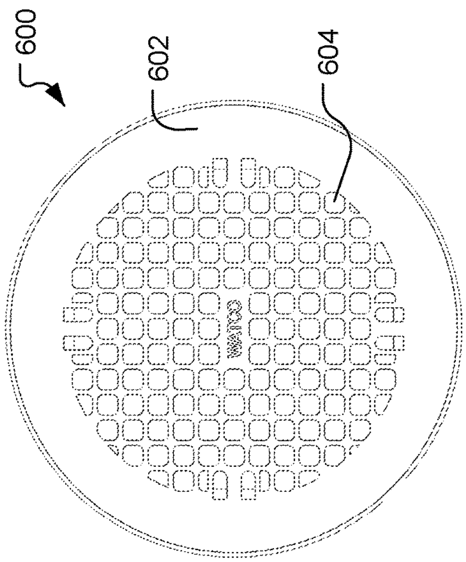

FIG. 6D

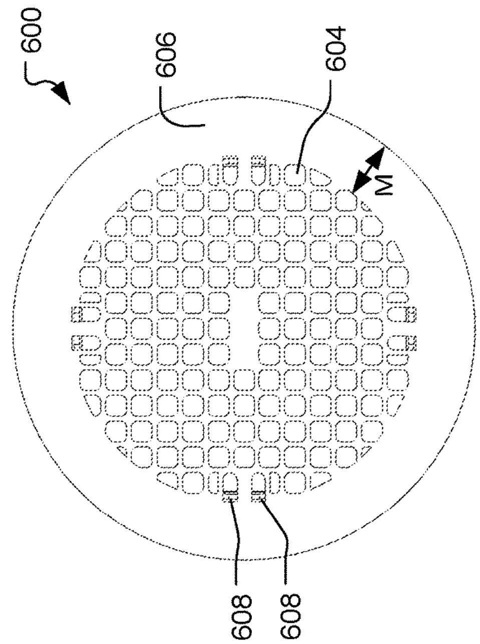

FIG. 6E

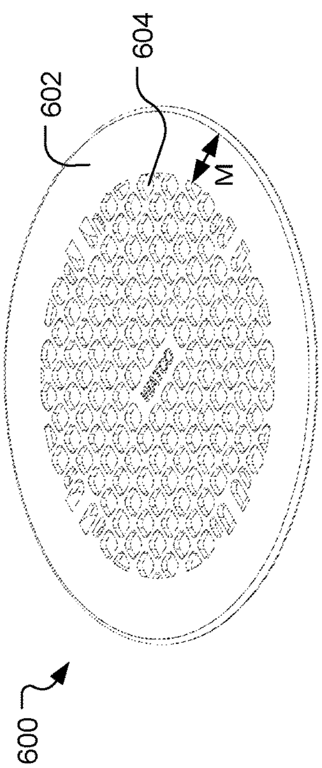

FIG. 6A

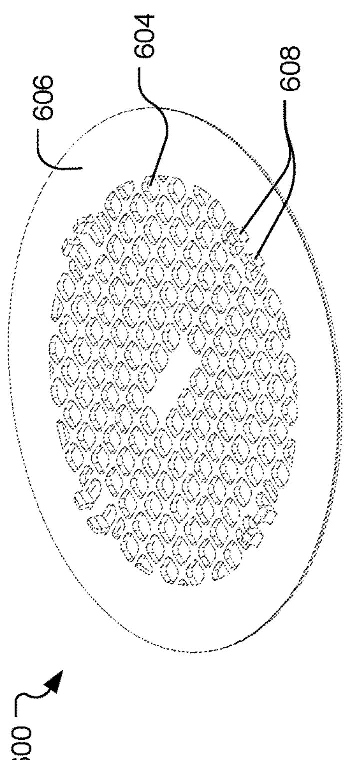

FIG. 6B

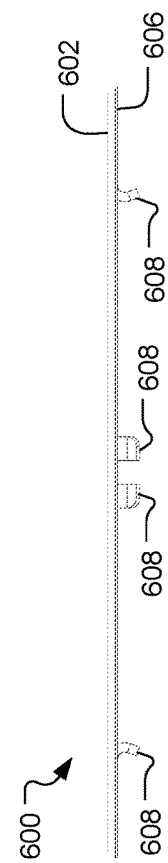

FIG. 6C

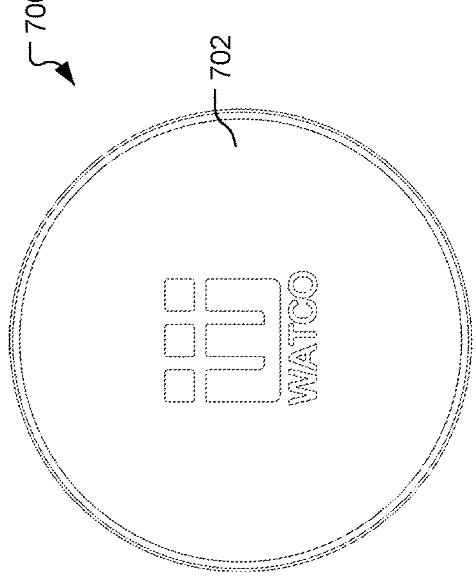

FIG. 7C

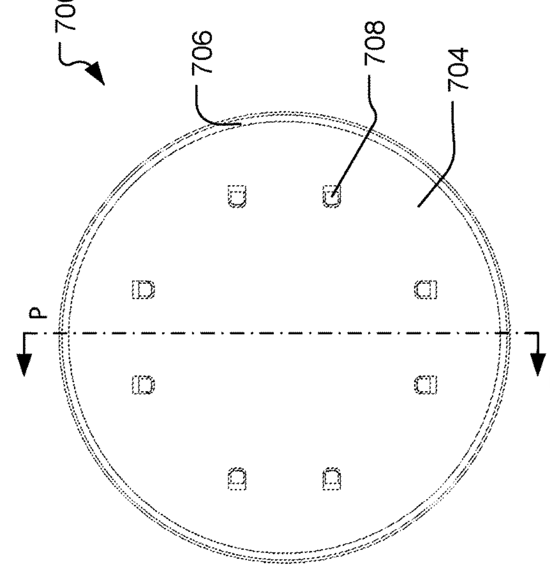

FIG. 7D

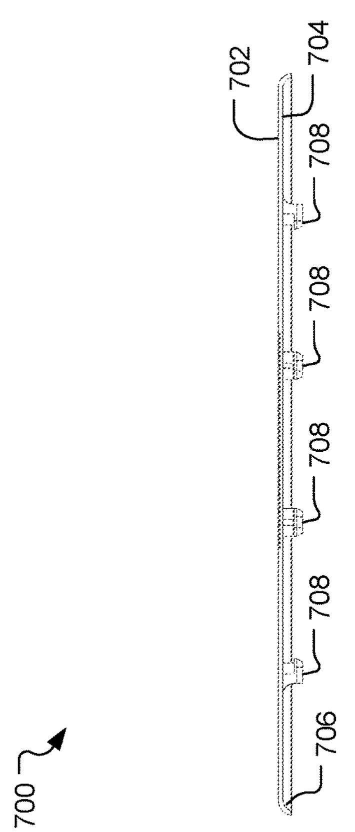

FIG. 7A

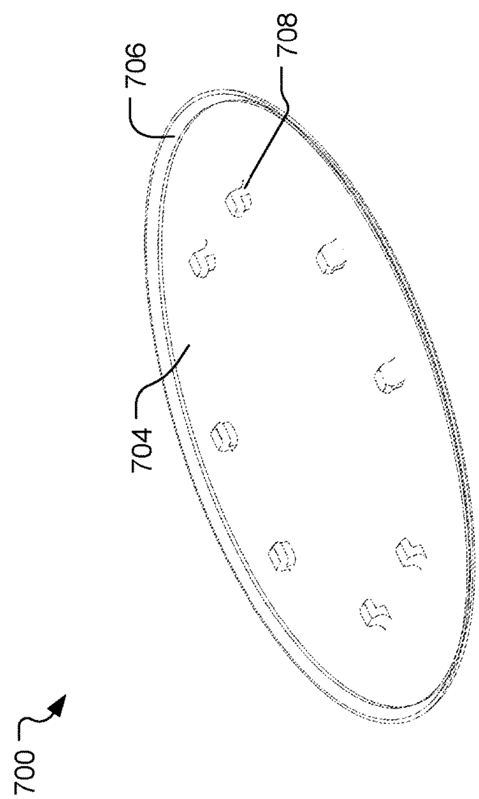

FIG. 7B

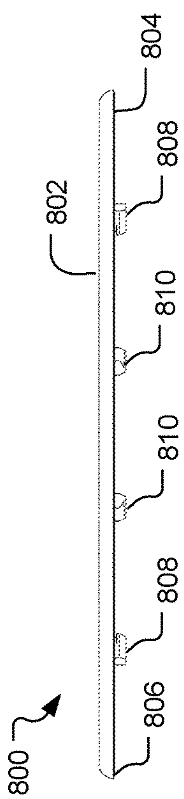

FIG. 8A

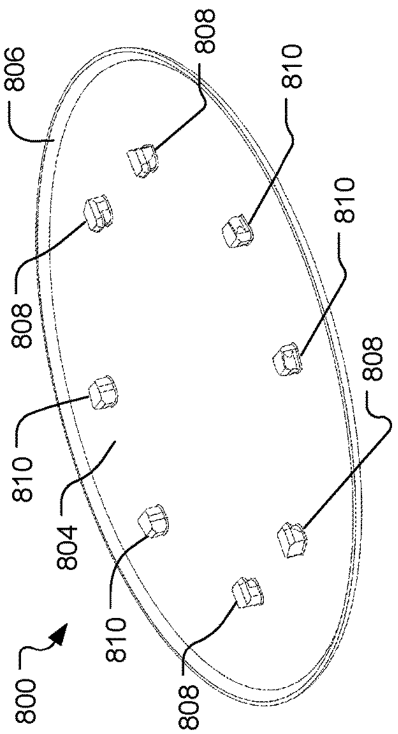

FIG. 8B

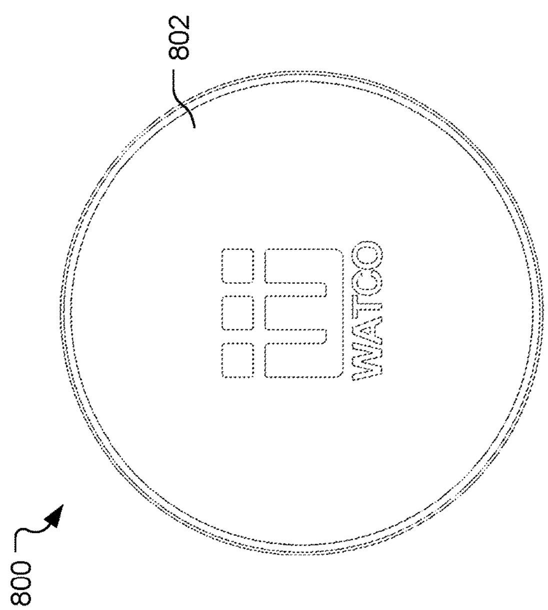

FIG. 8C

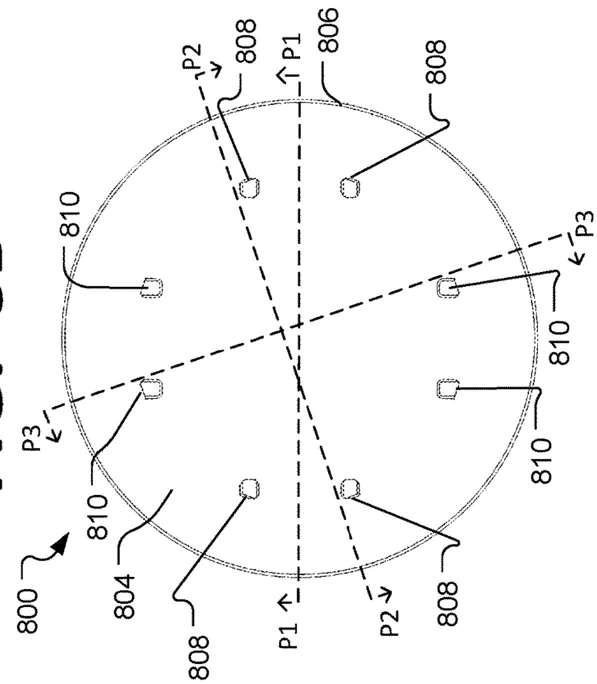

FIG. 8D

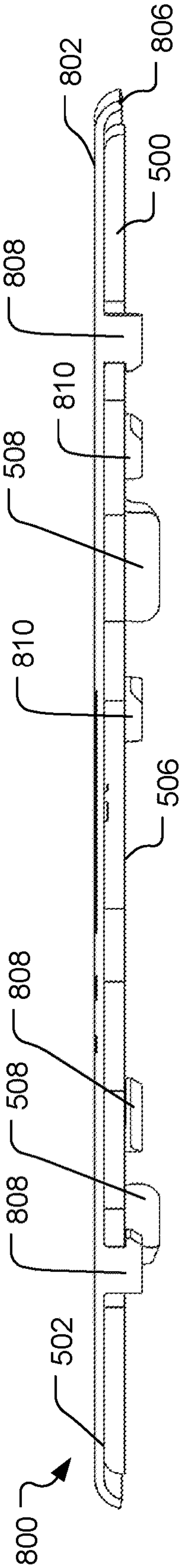
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FIG. 8E

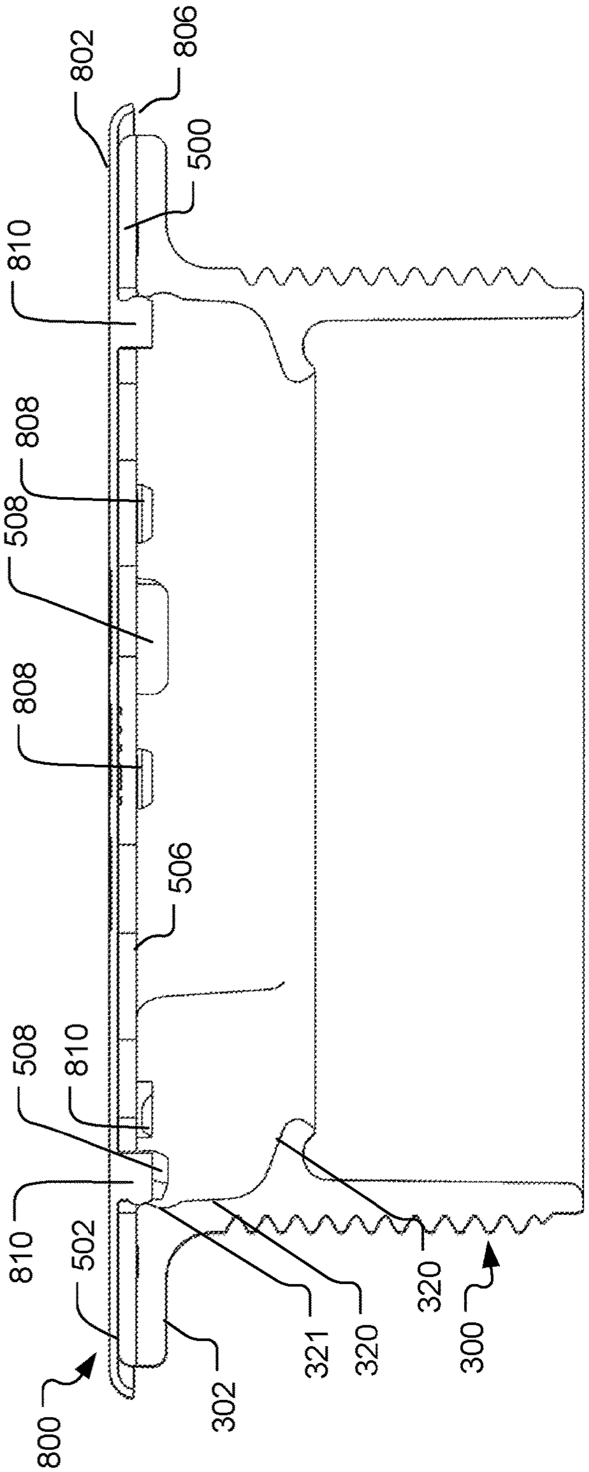
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FIG. 8F

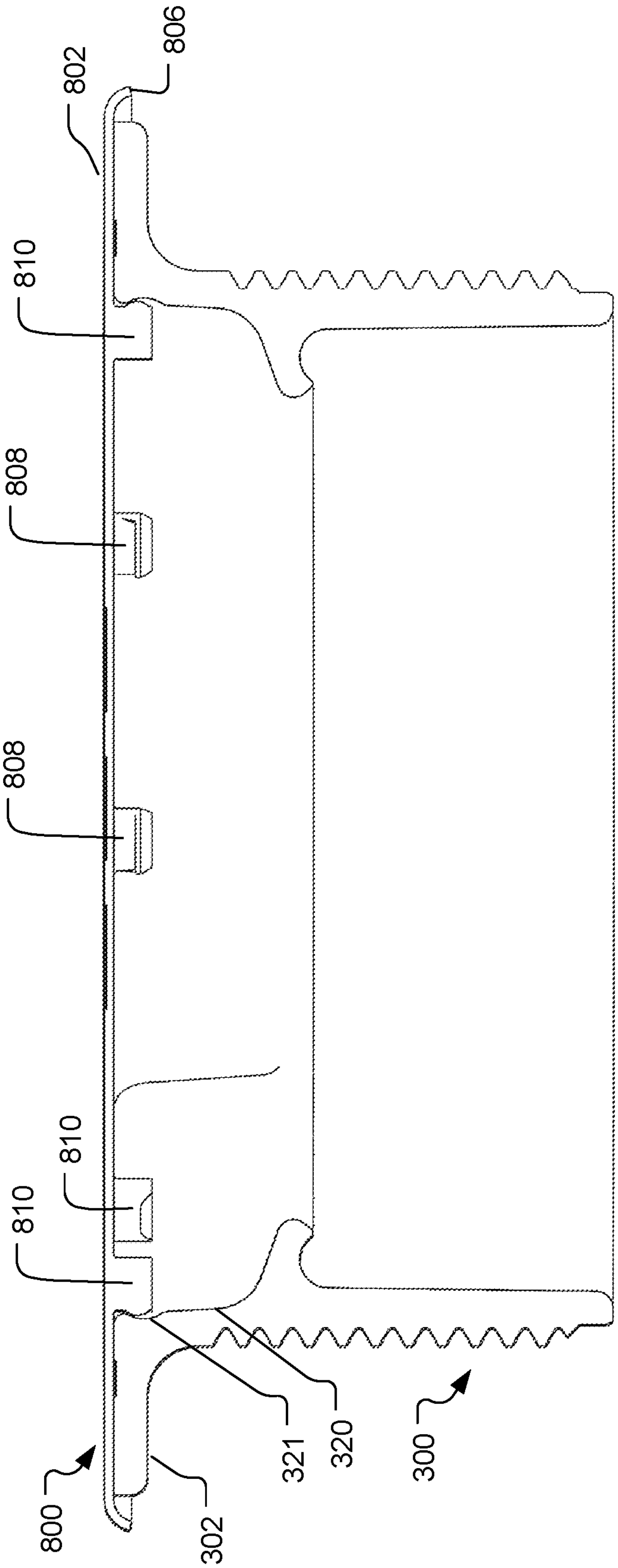

FIG. 8G

SHOWER DRAIN AND PROTECTIVE COVER

RELATED APPLICATION(S)

This application is a continuation-in-part of U.S. patent application Ser. No. 17/506,211, filed on or about Oct. 20, 2021, entitled "Shower Drain and Protective Cover," which is incorporated by reference herein in its entirety. To the extent appropriate, a claim for priority is made to the above-referenced application.

INTRODUCTION

Water receptacles, such as showers, generally include a drain port located at their lowermost point. The drain port is interconnected to a drain pipe through which wastewater flows. Drain components connect the drain pipe with aesthetic fixtures to contribute to the look and feel of a bathroom. During installation of drain components, a pressure test is performed to determine if the components have formed a proper seal about the drain pipe. Additionally, to establish a proper seal, torque is often applied to various drain components using one or more tools.

It is with respect to this general technical environment that aspects of the present technology disclosed herein have been contemplated. Furthermore, although a general environment is discussed, it should be understood that the examples described herein should not be limited to the general environment identified herein.

SUMMARY

This summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

Among other things, aspects of the present disclosure include systems for a shower drain assembly with a protective cover. In examples, the shower drain assembly includes a receptor including: an upper portion; and a lower portion couplable to a drain pipe. The shower drain assembly may further comprise a threaded flange including: a flange portion with a top surface; a threaded portion extending opposite the top surface, the threaded portion configured to thread into the upper portion of the receptor; and an upper interior surface. In examples, the shower drain assembly may also include a plate configured to cover the flange portion when installed on the threaded flange, and a protective cover. Examples of the protective cover include at least: a first friction tab configured to frictionally engage the plate; and a second friction tab configured to fictionally engage a feature of the upper interior surface when the plate is not installed on the threaded flange.

In other aspects, the present disclosure includes a protective cover comprising: a top surface; a bottom surface; a first pair of friction tabs extending from the bottom surface, wherein each of the first pair of friction tabs includes a first hook portion facing radially inward; and a second pair of friction tabs extending from the bottom surface, wherein each of the second pair of friction tabs includes a second hook portion facing radially outward.

In still further aspects, the present disclosure includes a shower drain assembly that includes a receptor including: an upper portion; and a lower portion couplable to a drain pipe.

The shower drain assembly may further comprise a threaded flange including: a flange portion with a top surface; a threaded portion extending opposite the top surface, the threaded portion configured to thread into the upper portion of the receptor; and an upper interior surface. In examples, the shower drain assembly may also include a plate configured to cover the flange portion when installed on the threaded flange, and a protective cover. Examples of the protective cover include: a top surface; a bottom surface; a first pair of friction tabs extending from the bottom surface and configured to frictionally engage at least one of the plate or a feature of the upper interior surface when the plate is installed on the threaded flange; and a second pair of friction tabs extending from the bottom surface and configured to fictionally engage the feature of the upper interior surface when the plate is not installed on the threaded flange.

It is to be understood that both the foregoing general description and the following Detailed Description are explanatory and are intended to provide further aspects and examples of the disclosure as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

The following drawing figures, which form a part of this application, are illustrative of aspects of systems and methods described below and are not meant to limit the scope of the disclosure in any manner, which scope shall be based on the claims.

FIGS. **1**A-**1**B show diagrams illustrating a shower drain assembly with multiple components.

FIGS. **2**A-**2**D show different perspective views of a receptor for the drain assembly of FIGS. **1**A-**1**B.

FIGS. **3**A-**3**D show different perspective views of a threaded flange for the drain assembly of FIGS. **1**A-**1**B.

FIGS. **3**E-**3**G show different perspective views of a threaded flange without a membrane for the drain assembly of FIGS. **1**A-**1**B.

FIG. **3**H shows engagement of the tabs of the threaded flange with a tool.

FIGS. **4**A-**4**D show different perspective views of a hair catcher for the drain assembly of FIG. **1**A.

FIGS. **5**A-**5**E show different perspective views of a cover plate for the drain assembly of FIG. **1**A.

FIGS. **6**A-**6**E show different perspective views of a cover plate for the drain assembly of FIG. **1**B.

FIGS. **7**A-**7**D show different perspective views of a protective cover for the drain assembly of FIGS. **1**A-**1**B.

FIGS. **8**A-**8**G show different perspective views of an alternative protective cover for the drain assembly of FIGS. **1**A-**1**B.

While examples of the disclosure are amenable to various modifications and alternative forms, specific aspects have been shown by way of example in the drawings and are described in detail below. The intention is not to limit the scope of the disclosure to the particular aspects described. On the contrary, the disclosure is intended to cover all modifications, equivalents, and alternatives falling within the scope of the disclosure and the appended claims.

DETAILED DESCRIPTION

As discussed briefly above, water receptacles, such as showers, generally include a drain port located at their lowermost point. The drain port is interconnected to a drain pipe or piping through which wastewater flows. During installation of drain components, a pressure test is performed to determine if the components have formed a proper seal about the drain pipe. Additionally, to establish a proper seal, torque is often applied to various drain components using one or more tools. Certain components may be replaced over time.

In particular, after a drain assembly is installed, the drain assembly may be pressure-tested to determine if the components of the drain assembly are properly sealed. In some situations, a membrane is used to perform this test. Some membranes are insertable into the assembly and others may be pre-coupled to components of the assembly. Placement of the membrane too deep in the assembly, however, may compromise the membrane by exposing the membrane to primers or glues. Additionally, placement of the membrane too deep in the assembly may also increase a risk that the membrane is dropped into the drain pipe when being removed. Additionally, membranes that are insertable after installation may not prevent debris from falling into the drain pipe during and after installation and prior to pressure testing. Regarding membranes that are pre-coupled to components of the assembly, depending on the surface area of the membrane and/or the minimum pressure to be exerted on the membrane during a pressure test, the membrane may not be able to withstand forces exerted on the membrane during a pressure test.

Additionally, coupling and decoupling of components of a drain assembly may require specialized tools, may risk damage to a component, and/or may generally be challenging for the installer. For example, applying rotational torque to a drain assembly component to secure the component about a shower pan may require a specialized tool for each brand or type of product. Additionally, outward-facing fixtures that are coupled to the drain assembly may be difficult to remove without scratching or otherwise damaging the aesthetic of the fixture. Moreover, these fixtures are subject to damage and scratching after installation of the drain assembly from the surrounding environment.

Among other things, the technologies disclosed herein address these circumstances by providing the below-discussed drain assembly and its components. In particular, the present technology describes functional design and placement of a membrane within a drain assembly, tab(s) to facilitate tightening of drain assembly components using general tools, inset(s) to facilitate decoupling of some components of the drain assembly, and a protective cover for fixtures of the drain assembly, among other features. With these concepts in mind, drain assemblies and their components are discussed below.

FIGS. **1**A-**1**B show diagrams illustrating a drain assembly **100**A, **100**B with multiple components. Some of the components shown in FIGS. **1**A-**1**B are discussed in further detail in FIGS. **2**A-**7**D. In the examples shown, the drain assembly **100**A, **100**B is configured to be secured about a shower pan. Shower pans may be composed of a variety of materials, such as plastic or metal. Design modifications to the disclosed systems may also be made to adapt the drain assembly **100**A, **100**B to be secured about a tile shower or other securing surface other than a shower pan.

With reference to FIG. **1**A, a drain assembly **100**A is illustrated that includes a receptor **200**, a friction gasket **102**, a compressible seal **104**, a threaded flange **300**, a hair strainer **400**, a plate **500**, and a protective cover **700**. In some examples, the protective cover **800** (described with respect to FIGS. **8**A-**8**G) may be substituted for protective cover **700**. When assembled, the components of the drain assembly **100**A are secured relative to each other and a shower pan and/or a drain pipe.

The receptor **200**, further described with respect to FIGS. **2**A-**2**D, is configured to couple to a drain pipe constructed from a material such as plastics polyvinyl chloride (PVC) or acrylonitrile butadiene styrene (ABS). A friction gasket **102** and a compressible seal **104** are positioned between the receptor **200** and a bottom side of a shower pan.

The friction gasket **102** is composed of an elastomeric material, such as PVC and/or ABS. In an example, the friction gasket **102** may have a thickness less than 3 mm, less than 2 mm, or less than 1 mm. In a specific example, the friction gasket **102** may have a thickness of approximately 0.020 inches+/−0.003 inches. The friction gasket **102** may provide a friction barrier between the receptor **200** and the compressible seal **104** to mitigate friction on the compressible seal **104** when the receptor **200** moves or rotates. For example, the friction gasket **102** may be rotatable relative to the receptor **200**. Continuing this example, when tightening or securing components of the drain assembly **100**A about a shower pan, the friction gasket **102** may reduce bunching and/or pinching of the compressible seal **104** by reducing friction between the receptor **200** and the compressible seal **104**. Thus, the friction gasket **102** aids in maintaining the integrity of the compressible seal **104** for proper sealing of the drain assembly about a shower pan.

The compressible seal **104** may be constructed of a compressible material, such as rubber. The material of the compressible seal **104** provides a water-tight seal between the receptor **200** and the shower pan when the drain assembly **100**A is secured to the shower pan. The compression of the material of the compressible seal **104**, when compressed against a shower pan, also provides a frictional force to secure the drain assembly **100**A about the shower pan.

The threaded flange **300**, further described with respect to FIGS. **3**A-**3**H, feeds through the top of the shower pan (e.g., via a drain port) and secures to the receptor **200**. In the example shown, the threaded flange **300** tightens about a shower pan by threading into the receptor **200**. A flange **302** of threaded flange **300** frictionally secures to the top of the shower pan. The threaded flange **300** includes at least one tab **310**, at least one inset **314**, and a removable membrane **316**. The membrane **316** may be composed of the same material as the friction gasket **102**. The threaded flange **300**, as well as the tab **310**, the inset **314**, and the membrane **316**, are further discussed below.

The hair strainer **400**, further described with respect to FIGS. **4**A-**4**D, may be positioned inside the threaded flange **300**. Although the hair strainer **400** is shown as a component of the drain assembly **100**A in FIG. **1**A, the hair strainer **400** is an optional component of the drain assembly **100**A. The hair strainer **400** includes at least one tab recess **406** that may align with the at least one tab **310** of the threaded flange **300**. Additionally, an upper lip **408** of the hair strainer **400** may be positioned below a top surface **306** of the threaded flange **300** when the hair strainer **400** is installed in the drain assembly **100**A.

The plate **500**, further described with respect to FIGS. **5**A-**5**E, may be frictionally coupled to the threaded flange **300**. When the plate **500** is secured to the threaded flange **300**, the hair strainer **400**, if included in the drain assembly **100**A, is retained between the threaded flange and the plate **500**. The plate **500** may partially or completely obscure the top surface of the threaded flange **300** when coupled. The plate **500** may be composed of a stiff material, such as stainless steel. The insets **314** on the threaded flange **300** may facilitate de-coupling of the plate **500** from the threaded flange **300** (e.g., to access the hair strainer **400**). For example, a flat lever (e.g., a flathead screwdriver or other flat, stiff tool) may be inserted into the inset **314** and used to apply an upward force onto a bottom surface **506** of the plate **500**, above the top surface **306** of the threaded flange **300**.

The protective cover **700**, further described with respect to FIGS. **7A-7D**, may frictionally secure to the plate **500**. In some examples, the protective cover **800** (described with respect to FIGS. **8A-8G**) may be substituted for protective cover **700**. The protective cover **700**, **800** may be composed of a flexible polymer or other material that facilitates coupling and decoupling of the protective cover **700** to the plate **500** and/or threaded flange **300**. Additionally, the protective cover **700**, **800** may partially or completely obscure the plate **500** when the plate **500** is coupled to the threaded flange **300**.

Turning to FIG. **1B**, a drain assembly **100B** is illustrated without a hair strainer **400**. In the example shown in FIG. **1B**, the drain assembly **100B** includes the receptor **200**, the friction gasket **102**, the compressible seal **104**, the threaded flange **300**, a plate **600**, and the protective cover **700**. The plate **600** in this example may be designed differently from plate **500** in FIG. **1A** and may facilitate hair-catching in lieu of a separate hair strainer (e.g., hair strainer **400**). Thus, in FIG. **1B**, the coupling and/or stacking of components in the drain assembly **100B** is the same, other than the plate **600** replacing the combination of the hair strainer **400** and the plate **500**. In other examples (not shown), the drain assembly **100B** may include the plate **600** and the hair strainer **400**. The receptor **200** connects to piping below a shower pan, with the friction gasket **102** and compressible seal **104** positioned between the receptor **200** and the bottom of the shower pan. The threaded flange **300** threads into the receptor **200** from the top side of the shower pan to secure the receptor **200**, the friction gasket **102**, the compressible seal **104**, and the threaded flange **300** about the shower pan, relative to each other. The plate **600** includes tabs (described in further detail in FIGS. **6A-6E**) that friction fit into an internal diameter of the threaded flange **300** opposite the receptor **200**. The protective cover **700** frictionally secures to the plate **600** to cover at least a portion of the exposed surface of the plate **600** after the plate is secured to the threaded flange **300**. In some examples, the protective cover **800** (described with respect to FIGS. **8A-8G**) may be substituted for protective cover **700**.

FIGS. **2A-8G** show various perspective views of the components described above with respect to the drain assemblies **100A**, **100B** of FIGS. **1A-1B**.

Referring to FIGS. **2A-2D**, different views of the receptor **200** for the drain assembly **100A**, **100B** of FIGS. **1A-1B** are shown. FIG. **2A** shows a side view of the receptor **200**, FIG. **2B** shows a perspective view of the receptor **200**, FIG. **2C** shows a top-down view of the receptor **200**, and FIG. **2D** shows a bottom-up view of the receptor **200**. As described herein, the receptor **200**, when the drain assembly is secured about a shower pan, is located below the shower pan. The receptor **200** may be composed of a plastic material, such as PVC, ABS, a combination of PVC/ABS, etc.

As shown in FIGS. **2A-2D**, the receptor **200** includes a flange **202**, a securing surface **204**, an upper portion **206**, a lower portion **208**, external tabs **210**, a pipe end **212**, and internal threads **214**. The receptor **200** is configured to be coupled to a drain pipe at the pipe end **212** and frictionally coupled to a bottom of a shower pan at securing surface **204** (e.g., which frictional coupling may include a friction gasket **102** and compressible seal **104** positioned between the securing surface **204** and the bottom of the shower pan).

The upper portion **206** of the receptor **200** extends below the flange **202** and opposite the securing surface **204**. The external diameter of the upper portion **206** is less than the external diameter of the flange **202**. The internal diameter D1 of the upper portion **206** includes the internal threads **214**. The internal diameter D1 of the upper portion **206** may be the same as the internal diameter of the flange **202**.

The lower portion **208** of the receptor **200** extends below the upper portion **206** opposite the flange **202**. The external diameter of the lower portion **208** is less than the external diameter of the upper portion **206** and the external diameter of the flange **202**. The internal surface of the lower portion **208** may be smooth (e.g., not threaded). The internal diameter D2 of the lower portion **208** may be less than the internal diameter D1 of the upper portion **206**. Additionally, the internal diameter D2 of the lower portion **208** may be sized to couple to a drain pipe of a known size (e.g., a 1.5-inch or 2-inch drain pipe).

The external tabs **210** may be positioned along the upper portion **206** and/or the lower portion **208** of the receptor **200**. The external tabs **210** protrude outward from an external surface of the upper portion **206** and/or lower portion **208**. The external tabs **210** may be configured to engage with one or more tools to secure or hold the receptor **200** during installation.

Although the receptor **200** shown in FIGS. **2A-2D** has an upper portion **206** and a lower portion **208** that are centered, an offset design is also appreciated. Additionally, the receptor **200** depicted includes example features and dimensions for assembly about a shower pan. Other features and dimensions are appreciated, such as a height-adjustable receptor **200** for installation about tiling, etc.

FIGS. **3A-3D** show different perspective views of a threaded flange **300** including a membrane **316** for the drain assembly **100A**, **100B** of FIGS. **1A-1B**. FIG. **3A** shows a side view of the threaded flange **300**, FIG. **3B** shows a perspective view of the threaded flange **300** with a membrane **316**, FIG. **3C** shows a top-down view of the threaded flange **300** with a membrane **316**, and FIG. **3D** shows a bottom-up view of the threaded flange **300** with a membrane **316**.

In contrast, FIGS. **3E-3G** show perspective views of a threaded flange **300** without the membrane **316** (e.g., after the membrane **316** has been decoupled from the threaded flange **300**). FIG. **3E** shows a perspective view of the threaded flange **300** without a membrane **316**, FIG. **3F** shows a top-down view of the threaded flange **300** without a membrane **316**, and FIG. **3G** shows a bottom-up view of the threaded flange **300** without a membrane **316**. As described above, the membrane **316** is a component of the threaded flange **300** until the membrane **316** is removed (e.g., after the threaded flange **300** is pressure tested or as otherwise desired). Additionally, as also described above, at least a portion of the threaded flange **300** is positioned above a shower pan when the drain assembly is secured about the shower pan. The threaded flange **300** may be composed of a rigid material, such as ABS.

As shown in FIGS. **3A-3G**, the threaded flange **300** includes a flange **302**, a securing surface **304**, a top surface **306**, a threaded portion **308**, tab(s) **310**, a vertical tab surface **312**, inset(s) **314**, a membrane **316** (prior to removal, with no membrane **316** shown in FIGS. **3E-3G**), a ridge **318**, an upper interior surface **320**, and a lower interior surface **322**.

When the drain assembly is secured about a shower pan, the securing surface **304** underneath the flange **302** is positioned to exert a force downward onto a top surface of the shower pan. The top surface **306** of the flange **302** is exposed above the shower pan. As shown, the top surface **306** is a ring with an exterior diameter and an interior diameter. Inset(s) **314** in the top surface **306** of the flange

302 may facilitate removal of other drain assembly components (e.g., plates **500**, **600**) frictionally coupled to the threaded flange **300**, as further described below.

A threaded portion **308** of the threaded flange **300** extends from the securing surface **304** downward opposite the top surface **306** of the flange **302**. The threaded portion **308** is sized and shaped (e.g., with external thread diameter D1' of the threaded portion **308**) to extend through a hole in the shower pan (e.g., a drain port) and thread into the internal threads **214** of the receptor **200** (with internal diameter D1). The threaded portion **308** has an interior cavity that includes an upper interior surface **320** and a lower interior surface **322**, separated by a ridge **318**. The ridge **318** may extend in a direction that is substantially parallel to the top surface **306**, toward a center of the interior cavity of the threaded portion **308**. The upper interior surface **320** and the lower interior surface **322** may each be smooth (e.g., unthreaded). The upper internal diameter D3 of the interior cavity that includes the upper interior surface **320** may be the same as the internal diameter of the flange **302**. The upper interior surface **320** extends downward from the flange **302**, opposite the top surface **306**, for an upper length L1 and ends at a ridge **318**. The ridge **318** protrudes into the interior cavity of the threaded portion **308** by a width W. At the ridge **318**, the ridge internal diameter D4 of the interior cavity is less than upper internal diameter D3. As shown, the ridge internal diameter D4 is less than the upper internal diameter D3 by two times the width W of the ridge (e.g., D3=D4+W+W). The lower internal diameter of the interior cavity that includes the lower interior surface **322** extends downward from the ridge **318**, opposite the upper interior surface **320**, for lower length L2. The lower internal diameter may be the same as the upper internal diameter D3. The lower length L2 may be greater than the upper length L1, such as at least 1.25 times greater, 1.5 times greater, 2 times greater, etc.). For example, the upper length L1 may be approximately 0.5 inches and the lower length L2 may be approximately 0.9 inches. The ridge **318** may be positioned in the middle two thirds of the internal cavity between the upper length L1 and the lower length L2. Thus, the ridge **318** may be spaced from the top surface **306** (by upper length L1) and spaced from the bottom end of the threaded portion **308** (by lower length L2). The ridge **318** may therefore be positioned completely internal to the interior cavity.

The upper interior cavity also includes tab(s) **310** that extend, in examples, from the top surface **306** of the flange **302** to the ridge **318**. The tab(s) **310** protrude radially inward from the upper interior surface **320** into the interior cavity in the same direction as the ridge **318**. In an example, the tab(s) **310** protrude into the interior cavity the same width W as the ridge **318**. The tab(s) **310** may facilitate stacking or alignment of other drain assembly components, such as a hair strainer **400** further described below.

Further, the tab(s) **310** include a vertical tab surface **312** on each side of any tab **310**. The vertical tab surface **312** is substantially orthogonal to the ridge **318** and the top surface **306**. The tab(s) **310** may facilitate rotation of the threaded flange **300** to secure to the receptor **200** and thus may facilitate installation of the drain assembly. The vertical tab surfaces **312** of the tab(s) **310** are configured to engage a variety of tools readily available to drain installers. For example, the vertical tab surfaces **312** of the tab(s) **310** are configured to engage handles of a pliers wrench, pliers, or any tool that includes two handles.

Use of a tool **350** to engage the tab(s) **310** of the threaded flange **300** is shown in FIG. **3**H. In FIG. **3**H, the tool **350** to engage the tab(s) **310** is a pliers wrench with two handles **352**, **354**, each engaging a vertical tab surface **312** of two different tabs **310**. The tool **350** may be rotated to exert force on the vertical tab surfaces **312** of the tabs **310** to cause rotation of the threaded flange **300**. Additional torque may be provided to rotate the tool **350** by using a second tool, such as a screw driver, as a lever to rotate the tool **350**. Although two tabs are shown in FIGS. **3**A-**3**H, any number of tabs **310** is appreciated.

The membrane **316** is removably coupled to the threaded flange **300** to facilitate pressure testing of the drain assembly after installation about a shower pan. The membrane **316** may be composed of a flexible or elastomeric material, such as PVC and/or ABS. In an example, the membrane **316** may have a thickness less than 3 mm, less than 2 mm, or less than 1 mm. In a specific example, the friction gasket **102** may have a thickness of approximately 0.020 inches+/−0.003 inches. The composition of the membrane **316** may be the same as the composition of the friction gasket **102** described above. If the membrane **316** and the friction gasket **102** are composed of the same material, both the membrane **316** and the friction gasket **102** may be cut from the same sheet of material during manufacturing. In particular, the membrane **316**, having an external diameter D5, may be cut out from a sheet inside the inner diameter of the friction gasket **102**, because the inner diameter of the friction gasket **102** is larger than the external diameter D5 of the membrane **316**. This manufacturing process may reduce wasted materials and reduce production time.

As described above, the membrane **316** may be coupled to the threaded flange **300**. The coupling may secure the membrane to the threaded flange **300** until removal of the membrane is required or desired (e.g., after pressure testing). In examples, the membrane **316** may be coupled to the threaded flange **300** via a variety of mechanisms, such as with friction, with an adhesive, using sonic welding, or other mechanism or combination of mechanisms for coupling the membrane **316** with the threaded flange **300**.

Describing an example where a membrane **316** is frictionally coupled to the threaded flange **300**, the frictional coupling may be based on a thickness of the membrane. For instance, a membrane **316** of greater thickness may frictionally engage with the threaded flange **300** if the thickness of the membrane **316** provides stiffness sufficient to prevent the membrane **316** from being pushed through the threaded flange **300** during a pressure test.

In a different example, a membrane **316** is coupled to the threaded flange **300** with an adhesive (e.g., liquid, paste, film, tape, etc.). The adhesive may allow for the membrane **316** to decouple from the threaded flange **300** under certain strain. For instance, an adhesive bond between the membrane **316** and the threaded flange **300** may break when a force exceeding a threshold (e.g., a force greater than that applied during a pressure test) is applied to the membrane **316**. In another instance, an adhesive bond between the membrane **316** and the threaded flange **300** may weaken or release under a change in temperature (e.g., applying heat). Other strains may be applied to an adhesive to otherwise allow the membrane **316** to be decoupled from the threaded flange **300**.

Alternatively, the membrane **316** may be coupled to the threaded flange **300** via sonic welding. During sonic welding, the material of the membrane **316** is solid-state welded with a high-frequency vibratory energy while the welded pieces are held together under pressure. Sonic welding produces a bond between the materials of the two welded components without melting the base material. In the examples provided herein, the two welded components are the membrane **316** and the ridge **318** of the threaded flange **300**. Using the examples described herein, the membrane **316** is sonically welded to the ridge **318** with a horn applying a physical force and energy in the form of high-frequency vibrations to the membrane **316** in the direction of the ridge **318**. Under the physical force (e.g., pressure) and energy exerted by the horn, the membrane **316** forms a removable weld with the ridge **318** of the threaded flange **300**. Aspects of securing a membrane to an overflow system are further described in U.S. Pat. No. 5,890,241, which is incorporated by reference in its entirety. An example of sonic welding of a membrane is also used by the Watco® Innovator® Overflow Elbow product. These examples of sonic welding of a membrane, however, differ in application, placement, and direction of the sonic weld relative to a pressure to be applied to the membrane, as further described, below.

In the examples shown in FIGS. **3**A-**3**D, the membrane **316** is sonically welded to the threaded flange **300** along the edge of the membrane **316** at a bottom surface of the ridge **318** (e.g., the surface of the ridge **318** adjacent the lower interior surface **322** and opposite the upper interior surface **320**, the tab(s) **310**, and the top surface **306**). This positioning of the membrane **316** leaves the upper interior cavity of the threaded flange **300** exposed during assembly (e.g., the upper interior surface **320**, the tab(s) **310**, and the upper surface of the ridge **318** are exposed when the membrane **316** is coupled to the threaded flange **300** and when the threaded flange **300** is coupled to the receptor **200**). Thus, the membrane diameter D**5** of the membrane **316** is greater than the ridge diameter D**4** and less than or equal to the lower internal diameter (which, in the examples depicted is equal to the upper internal diameter D**3**), such that the edge of the membrane **316** may completely overlap with the width W of the ridge **318** (e.g., D**4**<D**5**<D**3**=D**4**+W+W).

Additionally, in the examples depicted, the sonic weld of the membrane **316** and the bottom surface of the ridge **318** is in the direction of the top surface **306** of the threaded flange **300**. Thus, the direction of the sonic weld, in these examples, is in the same direction as any pressure to be exerted on the membrane **316** during a pressure test of the drain assembly. Because the direction of the sonic weld and the exerted pressure are aligned in the same direction (upward, toward the top surface **306** of the threaded flange **300**), the membrane **316** can withstand higher pressures and/or the membrane **316** can be used to test relatively large diameters with greater membrane surface area. In the examples depicted herein, the ridge diameter D**4**, which is the diameter subject to any pressure testing, is relatively large (e.g., has a diameter greater than two inches or is at least 2.5 inches), such that pressure testing in the same direction as the sonic weld is required or desired. As an alternative to aligning a sonic weld with the direction of a pressure test, a thickness of the membrane **316** may be increased.

Regarding pressure testing of the membrane **316**, a different force is applied to the membrane **316** depending on the surface area of the membrane **316**. For example, a pressure test of 22 pounds per square inch (PSI) on a 2-inch diameter membrane **316** exerts approximately 69 pounds of force on the membrane **316**. Alternatively, the same pressure test of 22 PSI on a 2.5-inch diameter membrane **316** exerts approximately 108 pounds of force on the membrane **316**. To sustain greater forces, the membrane **316** may be required or desired to be coupled to the threaded flange **300** on an underside of a lip **318** of the threaded flange **300** (e.g., as shown in FIG. **3**D), during a pressure test. In an example, membranes **316** tested at approximately 22 PSI with thicknesses less than 1 mm may be coupled to the underside of the lip **318** when the diameter of the membrane **316** is greater than 2 inches, greater than 2.1 inches, greater than 2.2 inches, greater than 2.3 inches, greater than 2.4 inches, etc.

The membrane **316** can be removed from the threaded flange **300** (e.g., after pressure testing the installed drain assembly) with a force opposite the direction of the coupling (e.g., friction, adhesive, sonic weld, etc.). In the example shown, the membrane **316** may be removed with a force in a downward direction toward the lower interior cavity of the threaded portion **308** of the threaded flange **300** (e.g., a force opposite the top surface **306** of the threaded flange **300** and toward a base of the threaded flange **300**). If the membrane is removed when the drain assembly is installed, a downward force onto the membrane **316** may release the coupling (e.g., friction, adhesive, sonic weld, etc.) and the membrane **316** may fall into the lower interior cavity of the threaded flange **300** or into an interior cavity of the receptor **200**. The membrane **316** may be prevented from falling into a coupled drain pipe by the receptor **200**, because the membrane diameter D**5** is larger than the internal diameter D**2** of the lower portion **208** of the receptor **200**. A membrane **316** that is no longer coupled to the threaded flange **300** may be grasped and removed from the drain assembly with a tool, such as pliers, or by hand.

The placement and coupling of the membrane **316** for the drain assembly thus includes the following summary of features. The membrane **316** may be coupled to the threaded flange **300** via sonic welding. The sonic weld may be in the same direction as a pressure test applied to the drain assembly. Because the sonic weld is in the direction of applied pressure, the membrane **316** can withstand higher pressures and/or larger surface areas to which pressure is applied. The membrane **316** is coupled to the threaded flange **300** at a ridge **318** in an interior cavity of the threaded flange **300**. The ridge **318** and the membrane **316** are positioned away from a pipe end **212** of the receptor **200**, when the drain assembly is installed and the threaded flange **300** is coupled to the receptor **200**. This placement of the membrane **316** inside the interior cavity of the threaded flange **300** reduces a likelihood that PVC primer and/or PVC glue, used in coupling the receptor **200** with a drain pipe, contacts the membrane **316**. Contact with PVC primer and/or PVC glue may be detrimental to the integrity of the membrane **316** and may otherwise compromise the membrane **316** in such a way to cause the membrane **316** to malfunction during a pressure test.

FIGS. **4**A-**4**D show different perspective views of a hair strainer **400** for the drain assembly **100**A of FIG. **1**A. FIG. **4**A shows a side view of the hair strainer **400**, FIG. **4**B shows a perspective view of the hair strainer **400**, FIG. **4**C shows a top-down view of the hair strainer **400**, and FIG. **4**D shows a bottom-up view of the hair strainer **400**.

The hair strainer **400**, as shown, includes a body **402**, drainage holes **404**, at least one tab recess **406**, an upper lip **408**, a base **410**, and a protrusion **412**. The hair strainer **400** may be an optional component of the drain assembly. Additionally, the hair strainer **400** may be configured to be dropped inside an interior cavity of the threaded flange **300** above the ridge **318**. Thus, the hair strainer **400** is removable from the drain assembly (e.g., for cleaning, replacement, etc.). The at least one tab recess **406** of the hair strainer **400** is configured to engage the at least one tab **310** of the threaded flange **300** to position the hair strainer **400** inside of the threaded flange **300**. The hair strainer **400** may gravitationally secure to the threaded flange **300**. Additionally, the hair strainer **400** may be separate and independent from a plate **500**, **600** of the drain assembly. For example, the hair strainer **400** may not couple or secure to a plate **500**, **600**. Stated alternatively, the hair strainer **400** may gravitationally couple only to the threaded flange **300** and no other component of the drain assembly.

When coupled to the threaded flange **300**, the upper lip **408** of the hair strainer **400** is positioned below the flange **302** of the threaded flange **300**. In an example, a portion of the body **402** of the hair strainer **400** rests on the ridge **318** of the threaded flange **300**, inside the interior cavity of the threaded flange **300**. Thus, the strainer upper diameter D**6** at the upper lip **408** of the hair strainer **400** may be the same or less than the upper internal diameter D**3** of the interior cavity of the threaded flange **300**. Additionally, the strainer lower diameter D**7** at the base **410** of the hair strainer **400** may be the same or less than the ridge diameter D**4** of the interior cavity of the threaded flange **300**. A height H of the hair strainer **400** may be the same or less than the lower interior length L**2** of the lower interior surface **322** of the threaded flange **300** so as to fully rest inside the interior cavity of the threaded portion **308** of the threaded flange **300** (e.g., after the membrane **316** is removed).

The body of the hair strainer **400** includes the upper lip **408**, the base **410**, and the protrusion **412**. Cutouts from the body **402** include tab recess(es) **406** and drainage holes **404**. The body of the hair strainer **400** may be composed of a durable, cleanable, and/or disposable, lightweight material, such as plastic. The diameter of the upper lip **408** is greater than the diameter of the base **410**. As shown, the body **402** curves from the upper lip **408** inward toward the base **410**. A protrusion **412** may protrude from the base **410** upward toward the upper lip **408**.

The drainage holes **404** of the hair strainer **400**, may be shaped and sized to facilitate drainage while catching hair and debris. The drainage holes **404** may include a variety of shapes and sizes, depending on their location about the body **402** of the hair strainer **400**. For example, drainage holes **404** near the base of the hair strainer **400** may be smaller (e.g., smaller surface area) than drainage holes **404** near the upper lip **408**.

The tab recess(es) **406** are sized and shaped relative to the tab(s) **310** on the threaded flange **300**, such that the tab recess(es) **406** fit around the tab(s) **310**. The tab recess(es) **406** extend toward the center of the base **410** of the body **402** of the hair strainer **400** from the upper lip **408**.

FIGS. **5**A-**5**E and FIGS. **6**A-**6**E show two different plates **500**, **600** for the drain assembly **100**A, **100**B. As further described above with respect to FIGS. **1**A-**1**B, the plate **600** shown in FIGS. **6**A-**6**E may be used in lieu of a combination of a hair strainer **400** and plate **500**. This is, in part, due to the difference in drainage holes **604** of the plate **600** in FIGS. **6**A-**6**E as compared with the drainage holes **504** of the plate **500** in FIGS. **5**A-**5**E. Each of the plates **500**, **600** shown in FIGS. **5**A-**5**E and **6**A-**6**E may be made of a rigid material, such as stamped, stainless steel, with any finish.

FIGS. **5**A-**5**E show different perspective views of a plate **500** for the drain assembly **100**A of FIG. **1**A. FIG. **5**A shows a top perspective view of the plate **500**, FIG. **5**B shows a bottom perspective view of the plate **500**, FIG. **5**C shows a side view of the plate **500**, FIG. **5**D shows a top-down view of the plate **500**, and FIG. **5**E shows a bottom-up view of the plate **500**.

The plate **500** shown in FIGS. **5**A-**5**E includes a top surface **502**, one or more drainage hole(s) **504**, a bottom surface **506**, and one or more friction tab(s) **508**. The plate **500** is shaped and sized relative to the threaded flange **300**. In the example shown, the top surface **502** is a circle.

The friction tab(s) **508** are configured to exert an outward force on an upper interior surface **320** of the threaded flange **300**. This outward force may result from a shape of the friction tab(s) **508**. The friction tab(s) **508** may therefore frictionally couple to the threaded flange **300**. Additionally, the bottom surface **506** of the plate **500** is positionable onto the top surface **306** of the threaded flange **300**. In the example shown, the friction tab(s) **508** curve away from a center of the plate **500**. Although a specific curvature of the friction tab(s) **508** is shown, any shape is appreciated that creates a diameter between two or more friction tabs **508** that is greater than or equal to the diameter D**3** of the upper interior surface **320** of the threaded flange **300**. The shape and position of the friction tab(s) **508** is relative to the drainage holes **504**. The friction tab(s) **508** may be configured to further facilitate draining through the drainage holes **504** by not obstructing the drainage holes **504** (e.g., from a top-down view shown in FIG. **5**D). Although FIGS. **5**A-**5**E show a plate **500** with four friction tabs **508**, any number of friction tabs **508** is appreciated. The friction tabs **508** may be spaced radially about the bottom surface **506** of the plate **500**. Additionally, the friction tabs **508** may be spaced symmetrically about one or more halves of the plate **500**.

The drainage holes **504** may be positioned to form a margin M along an edge of the plate **500**. The margin M may be symmetric about the plate **500**. The margin M may align with the top surface **306** of the flange **302** of the threaded flange **300**, when the plate **500** is coupled to the threaded flange **300**. For example, the margin M may completely obscure the top surface **306** of the threaded flange **300** when the plate **500** is frictionally coupled to the threaded flange **300**. A margin M approximately the length of the flange **302** of the threaded flange **300** may further facilitate drainage by maximizing the surface area through which fluid may drain through the drainage holes **504**. Although FIGS. **5**A-**5**E show a plate **500** with 36 drainage holes **504**, any number of drainage holes **504** is appreciated (e.g., 50 or less drainage holes, 40 or less drainage holes, 30 or less drainage holes, 20 or less drainage holes, etc.). The drainage holes **504** may be spaced radially or axially about the plate **500**. Additionally, the drainage holes **504** may be spaced symmetrically about one or more halves of the plate **500**.

FIGS. **6**A-**6**E show different perspective views of a plate **600** for the drain assembly **100**B of FIG. **1**B. FIG. **6**A shows a top perspective view of the plate **600**, FIG. **6**B shows a bottom perspective view of the plate **600**, FIG. **6**C shows a side view of the plate **600**, FIG. **6**D shows a top-down view of the plate **600**, and FIG. **6**E shows a bottom-up view of the plate **600**.

Similar to the plate **500** described with respect to FIGS. **5**A-**5**E, the plate **600** shown in FIGS. **6**A-**6**E is shaped and sized relative to the threaded flange **300**, and includes a top surface **602**, one or more drainage hole(s) **604**, a bottom surface **606**, and one or more friction tab(s) **608**.

The friction tab(s) **608** are configured to exert an outward force on an upper interior surface **320** of the threaded flange **300**. This outward force may result from a shape of the friction tab(s) **608**. The friction tab(s) **608** may therefore frictionally couple to the threaded flange **300**. Additionally, the bottom surface **606** of the plate **600** is positionable onto the top surface **606** of the threaded flange **300**. In the example shown, the friction tab(s) **608** curve away from a center of the plate **600**. Although a specific curvature of the friction tab(s) **608** is shown, any shape is appreciated that creates a diameter between two or more friction tabs **608** that is greater than or equal to the diameter D3 of the upper interior surface **320** of the threaded flange **300**. The shape and position of the friction tab(s) **608** is relative to the drainage holes **604**. The friction tab(s) **608** may be configured to further facilitate draining through the drainage holes **604** by not obstructing the drainage holes **604** (e.g., from a top-down view shown in FIG. **6**D, the friction tab(s) **608** are not visible). Although FIGS. **6**A-**6**E show a plate **600** with eight friction tabs **608**, any number of friction tabs **608** is appreciated. The friction tabs **608** may be spaced radially about the bottom surface **606** of the plate **600**. Additionally, the friction tabs **608** may be spaced symmetrically about one or more halves of the plate **600**. Further, the friction tabs **608** may be positioned in groups (e.g., multiple pairs of friction tabs **608**, as shown).

Similar to the plate **500** describe above, the drainage holes **604** may be positioned to form the margin M along an edge of the plate **600**, where the margin M may be symmetric about the plate **600**. The margin M may align with the top surface **306** of the flange **302** of the threaded flange **300** (e.g., to completely obscure the top surface **306** of the threaded flange **300**), when the plate **600** is coupled to the threaded flange **300**. Although FIGS. **6**A-**6**E show a plate **600** with **142** drainage holes **604**, any number of drainage holes **604** is appreciated (e.g., at least 50 drainage holes, at least 100 drainage holes, at least 150 drainage holes, etc.). The drainage holes **604** may be spaced radially or axially about the plate **600**. Additionally, the drainage holes **604** may be spaced symmetrically about one or more halves of the plate **600**.

Either plate **500**, **600** shown in FIGS. **5**A-**5**E or **6**A-**6**E is couplable to (e.g., via friction tabs **508**, **608**), and removable from, the threaded flange **300**. In an example, the insets **314** on the flange **302** of the threaded flange **300** may facilitate removal or de-coupling of the plate **500**, **600** from the threaded flange **300**. For example, a flat lever (e.g., flathead screwdriver) may be inserted into the inset **314** of the threaded flange **300** and tilted or rotated to apply a force onto the bottom surface **506**, **606** of the plate **500**, **600**.

The drainage holes **504**, **604** of the plates **500**, **600** show different configurations with different functions. The drainage holes **504** on the plate **500** shown in FIGS. **5**A-**5**E are larger than the drainage holes **604** on the plate **600** shown in FIGS. **6**A-**6**E. A larger drainage hole **504** facilitates quicker drainage, but allows more debris to pass through the drainage hole. Thus, the relatively smaller drainage holes **604** of the plate **600** shown in FIGS. **6**A-**6**E catch hair and other debris on the top surface **602** of the plate **600** for easy removal, without desiring a separate hair strainer (e.g., hair strainer **400**, which may be optionally added to a drain assembly including a plate with larger drainage holes). Smaller drainage holes may be desired in environments where frequent and quick cleaning is desirable (e.g., a hotel).

FIGS. **7**A-**7**D show different perspective views of a protective cover **700** for the drain assembly **100**A, **100**B of FIGS. **1**A-**1**B. FIG. **7**A shows a side cross-sectional view at cut plane P of the protective cover **700**, FIG. **7**B shows a bottom perspective view of the protective cover **700**, FIG. **7**C shows a top-down view of the protective cover **700**, and FIG. **7**D shows a bottom-up view of the protective cover **700**.

After a drain assembly is installed, the plate (e.g., plate **500** or plate **600**) is exposed and subject to wear and tear or damage from the environment. In some instances, the drain assembly may be installed prior to completion of other construction on the premises. A construction environment may increase a likelihood that the plate of the drain assembly is scratched or otherwise damaged, due to airborne particles, direct contact with construction materials, walking-on with work boots of construction workers, etc.

To prevent damage to the plate **500**, **600** of an installed drain assembly **100**A, **100**B, the protective cover may be coupled to the plate **500**, **600** to partially or completely obscure the plate **500**, **600**, thereby protecting the finish of the plate **500**, **600**. Additionally or alternatively, the protective cover **700** may cover one or more drainage holes **504**, **604** of the plate **500**, **600** to reducing debris from falling inside the drain assembly **100**A, **100**B onto the membrane **316** and/or drain pipe (e.g., after removal of the membrane **316**). The protective cover **700** may be easily removable and/or discardable, such as at a time when the plate **500**, **600** is not exposed to an environment with high risk of damage. In an example, the protective cover may be composed of a plastic or other flexible material. Additionally, the protective cover **700** may be colored (e.g., green) and/or branded.

As shown in FIGS. **7**A-**7**D, the protective cover **700** includes a top surface **702**, a bottom surface **704**, a lip **706**, and at least one friction tab **708**. The protective cover **700** is shaped and sized relative to the plate **500**, **600**. In the example shown, the top surface **702** is a circle with the lip **706** designed to curve around a thickness of the plate **500**, **600**. The lip **706** may frictionally couple to the plate **500**, **600**. The bottom surface **704** of the protective cover **700** is positionable onto the top surface **602** of the plate **500**, **600**. At least one friction tab **708** protrudes from the bottom surface **704** to frictionally engage at least one drainage hole **504**, **604** of the plate **500**, **600**. Although FIGS. **7**A-**7**D show a protective cover **700** with eight friction tabs **708**, any number of friction tabs **708** is appreciated. The friction tabs **708** may be spaced radially about the bottom surface **704** of the protective cover. Additionally, the friction tabs **708** may be spaced symmetrically about one or more halves of the protective cover **700**. The friction tabs **708** may protrude from the bottom surface **704** of the protective cover **700** to a depth greater than or equal to a depth of the drainage holes **504**, **604** of the plate **500**, **600**. The friction tabs **708** may also include a hook configured to snap or frictionally fit around the drainage holes **504**, **604** and engage with the bottom surface **506**, **606** of the plate **500**, **600**. Although the hooks of the friction tabs **708** are shown facing substantially toward a center of the protective cover **700**, the hooks may face in any direction, independent of each other, such that the hook is positioned to be engageable with the bottom surface **506**, **606** of the plate **500**, **600** via the drainage holes **504**, **604**.

FIGS. **8**A-**8**G show different perspective views of an alternative protective cover **800** for the drain assembly **100**A, **100**B of FIGS. **1**A-**1**B. FIG. **8**A shows a side cross-sectional view at cut plane P1 of the protective cover **800**, FIG. **8**B shows a bottom perspective view of the protective cover **800**, FIG. **8**C shows a top-down view of the protective cover **800**, and FIG. **8**D shows a bottom-up view of the protective cover **800**. FIG. **8**E depicts side cross-sectional view at cut plane P2 when the protective cover **800** is installed on plate **500**. FIG. **8**F depicts a side cross-sectional view at cut plane P3 when the protective cover **800** is installed on a plate **500** that is installed on a threaded flange **300**. FIG. **8**G depicts a side cross-sectional view at cut plane P2 when the protective cover **800** is installed directly onto the threaded flange **300** with no plate installed.

Protective cover **800** is similar to protective cover **700**; however, while protective cover **800** includes some friction tabs **808** that point inward to engage with plate **500**, **600** (similar to friction tabs **708**), protective cover **800** also includes some friction tabs **810** that point outwards and engage with a feature of the upper interior surface **320** of the threaded flange **300**, such as groove **321** (see FIGS. **8**F, **8**G).

The protective cover **800** may, therefore, be used with or without a plate **500**, **600** installed on the threaded flange **300**. For example, the protective cover **800** may be installed directly onto the threaded flange **300** (without a plate **500**, **600** installed). Alternatively, the protective cover **800** may be installed on top of the plate **500**, **600**. In this manner, the same protective cover **800** may be used whether or not a plate **500**, **600** is installed. This is useful, in examples, because a shower may be roughed in (e.g., the receptor **200** and the threaded flange **300** may be installed) for a period of time before any trim pieces of the shower (such as the plate **500**, **600**) are installed, and it is useful to be able to use the same protective cover **800** in either instance.

For example, to prevent damage to the plate **500**, **600** of an installed drain assembly **100**A, **100**B, the protective cover **800** may be coupled to the plate **500**, **600** installed on the threaded flange **300** to partially or completely obscure the plate **500**, **600**, thereby protecting the finish of the plate **500**, **600**. Additionally or alternatively, the protective cover **800** may cover one or more drainage holes **504**, **604** of the plate **500**, **600** to reduce debris from falling inside the drain assembly **100**A, **100**B onto the membrane **316** and/or drain pipe (e.g., after removal of the membrane **316**). The protective cover **800** may be easily removable and/or discardable, such as at a time when the plate **500**, **600** (or the threaded flange) is not exposed to an environment with high risk of damage. In an example, the protective cover **800** may be composed of a plastic or other flexible material. In examples, the friction tabs **808** and **810** may be integrally formed as molded plastic with the rest of the protective cover **800**. Additionally, the protective cover **800** may be colored (e.g., green) and/or branded.

As shown in FIGS. **8**A-**8**D, the protective cover **800** includes a top surface **802**, a bottom surface **804**, a lip **806**, at least one friction tab **808**, and at least one friction tab **810**. The protective cover **800** is shaped and sized relative to the plate **500**, **600** and to the threaded flange **300**. For example, FIGS. **8**E, **8**F, **8**G depict the protective cover **800** installed on a plate **500**, on a plate **500** that is installed on a threaded flange **300**, and directly onto the threaded flange **300** with no plate installed, respectively. Although plate **500** is depicted in FIGS. **8**E-**8**F, plate **600** or another plate design could be used. In the examples shown, the top surface **802** is a circle with the lip **806** designed to curve around a thickness of the plate **500**. In examples, the lip **806** may frictionally couple to the plate **500**. In instances where the plate **500** is not installed (such as in FIG. **8**G), the lip **806** may frictionally engage with an outer perimeter of the threaded flange **300**.

In instances where a plate **500** is installed on the threaded flange **300** (e.g., FIG. **8**F), the bottom surface **804** of the protective cover **800** is positionable onto the top surface **502** of the plate **500**. At least one friction tab **808** protrudes from the bottom surface **804** to frictionally engage at least one drainage hole **504** of the plate **500**. In addition, with reference to FIG. **8**F, the tabs **508** of the plate **500** may engage with a feature of the threaded flange, such as groove **321**.

In addition, at least one friction tab **810** protrudes from the bottom surface **804**. With reference to FIG. **8**F, when a plate **500** is installed on the threaded flange **300**, the friction tab **810** does not engage with the groove **321** of the threaded flange **300**. That is, a bottom portion of the friction tab **810**, in examples, may touch a portion of the threaded flange **300**, but the friction tab **810** may be sized and shaped not to deflect or snap into the groove **321** when the protective cover **800** is installed onto a plate **500** that has been installed on the threaded flange **300**.

With reference to FIG. **8**G, when the protective cover **800** is installed directly onto the threaded flange **300** (and no plate **500** is installed), then friction tabs **810** may be sized and shaped to frictionally engage with a feature of at least the upper interior surface **320** of the threaded flange **300** (such as groove **321**). As such, the protected cover **800** may be frictionally engaged with either of the plate **500** or the threaded flange **300** to secure the protected cover in place and protect the plate **500**, the threaded flange **300**, and/or other components of the drain assembly **100**A, **100**B from damage or debris.

Although FIGS. **8**A-**8**G show a protective cover **800** with four friction tabs **808** and four friction tabs **810**, any number of friction tabs **808** and **810** is appreciated. The friction tabs **808** and **810** may be spaced radially about the bottom surface **804** of the protective cover **800**. Additionally, the friction tabs **808** and **810** may be spaced symmetrically about one or more halves of the protective cover **800**. The friction tabs **808** may protrude from the bottom surface **804** of the protective cover **800** to a depth greater than or equal to a depth of the drainage holes **504** of the plate **500**. For example, the friction tabs **808** may be positioned to extend from the bottom surface **804** of the protective cover **800** through the drainage holes **504** on either side of two of the four tabs **508** on the plate **500**. The friction tabs **808** may also include a hook configured to snap or frictionally fit around the outer perimeter of the drainage holes **504** and engage with the bottom surface **506** of the plate **500**. When no plate **500** is installed on the threaded flange **300**, the friction tabs **808** may be sized, shaped, and positioned to not engage with the threaded flange **300**. For example, an outer edge of the friction tabs **808** may be such that it does not reach the inner radius of the upper interior surface **320** of threaded flange **300**.

In examples such as FIG. **8**F, when installed over plate **500**, the friction tabs **810** may protrude from the bottom surface **804** of the protective cover **800** to a depth greater than a depth of the drainage holes **504** of the plate **500** so that friction tabs **810** extend past the plate **500**. In examples, friction tabs **810** may extend through the drainage holes **504** on either side of the other two of the four tabs **508** on the plate **500**. In examples, however, the friction tabs **810** do not engage the upper interior surface **320** of the threaded flange **300** when the protection cover **800** is installed over a plate **500**. That is, friction tabs **810** may touch the threaded flange **300**, but may be sized and shaped to not snap into the groove **321** of the threaded flange **300**. In other examples, the friction tabs **810** may be sized and shaped to include a portion that snaps into the groove **321** of the threaded flange **300** even when the protective cover **800** is installed over the plate **500**.

In examples such as FIG. **8**G, when installed directly onto the threaded flange **300** (with no plate **500** installed), friction tabs **810** may be configured to engage a feature (e.g., a groove **321**) of the upper interior surface **320** of the threaded flange **300** and/or exert an outward force on an upper interior surface **320** of the threaded flange **300**. In some examples, the upper interior surface **320** may include a feature (such as groove **321**) that is configured to engage a hook portion of friction tabs **810**. In some examples, the feature (such as groove **321**) may also be sized and shaped to engage a hook portion of the tab **508** when the plate **500** is installed. In other examples, the upper interior surface **320** may be smooth, and the friction tabs **810** may be configured to exert an outward force on the interior surface **320** to help hold the protective cover **800** in place. In examples, the friction tab(s) **810** may curve away from a center of the cover **800** similar to friction tabs **508**. In examples, any shape and positioning is appreciated that creates an outer diameter of the friction tabs **810** that is greater than or equal to the diameter D3 of the upper interior surface **320** of the threaded flange **300**.

Although not depicted in the figures, in other examples, protective cover **800** may include all outward-facing friction tabs, wherein friction tabs **808** and friction tabs **810** would be of different depths, but would both be designed to engage with a feature of the upper interior surface **320** of threaded flange **300**, such as groove **321**. For example, friction tabs **808** could be outward facing and longer so that they protrude with a hook portion at a first depth that would engage groove **321** when the protective cover **800** is installed over plate **500** on threaded flange **300**. In this additional example embodiment, the groove **321** may be axially widened so that when the protective cover **800** is installed directly onto the threaded flange **300** (with no plate **500**), the longer friction tabs **808** would still fit within the groove **321**. By contrast, the friction tabs **810** could be shorter than friction tabs **808** and could be shaped and sized as shown in FIGS. **8**A-**8**G. That is, friction tabs **810** may engage the groove **321** when the protective cover **800** is installed directly onto threaded flange **300** (without a plate **500** installed). When the protective cover **800** is installed onto plate **500** over the threaded flange **300**, the friction tabs **810** would still not engage the groove **321** (e.g., as shown in FIG. **8**F). In this manner, the same protective cover **800** could still be used to protect the elements of drain assembly **100**A, **100**B whether or not a plate **500** is then installed onto threaded flange **300**.

Although the present disclosure discusses the implementation of these techniques in the context of a drain assembly for a shower, the technology introduced above may be implemented for a variety of drainage needs. A person of skill in the art will understand that the technology described in the context of securing a drain assembly to a shower pan could be adapted for use with other systems such as a bathtub, a sink, shower tiles, etc. Additionally, a person of ordinary skill in the art will understand that the drain assembly may be implemented or installed with a variety of setups.

Those skilled in the art will recognize that the methods and systems of the present disclosure may be implemented in many manners and as such are not to be limited by the foregoing aspects and examples. In this regard, any number of the features of the different aspects described herein may be combined into single or multiple aspects, and alternate aspects having fewer than or more than all of the features herein described are possible. Functionality may also be, in whole or in part, distributed among multiple components, in manners now known or to become known.

Moreover, the scope of the present disclosure covers conventionally known manners for carrying out the described features and functions, and those variations and modifications that may be made to the components described herein as would be understood by those skilled in the art now and hereafter. In addition, some aspects of the present disclosure are described above with reference to block diagrams and/or operational illustrations of systems and methods according to aspects of this disclosure. The functions, operations, and/or acts noted in the blocks may occur out of the order that is shown in any respective flowchart. For example, two blocks shown in succession may in fact be executed or performed substantially concurrently or in reverse order, depending on the functionality and implementation involved.

Further, as used herein and in the claims, the phrase "at least one of element A, element B, or element C" is intended to convey any of: element A, element B, element C, elements A and B, elements A and C, elements B and C, and elements A, B, and C. In addition, one having skill in the art will understand the degree to which terms such as "about" or "substantially" convey in light of the measurements techniques utilized herein. To the extent such terms may not be clearly defined or understood by one having skill in the art, the term "about" shall mean plus or minus ten percent.

Numerous other changes may be made which will readily suggest themselves to those skilled in the art and which are encompassed in the spirit of the disclosure and as defined in the appended claims. While various aspects have been described for purposes of this disclosure, various changes and modifications may be made which are well within the scope of the disclosure. Numerous other changes may be made which will readily suggest themselves to those skilled in the art and which are encompassed in the spirit of the disclosure and as defined in the claims.

What is claimed is:

1. A shower drain assembly comprising:
- a receptor including:
  - an upper portion; and
  - a lower portion couplable to a drain pipe; and
- a threaded flange including:
  - a flange portion with a top surface;
  - a threaded portion extending opposite the top surface, the threaded portion configured to thread into the upper portion of the receptor; and
  - an upper interior surface;
- a plate configured to cover the flange portion when installed on the threaded flange; and
- a protective cover including at least:
  - a first friction tab configured to frictionally engage the plate; and
  - a second friction tab configured to fictionally engage a feature of the upper interior surface when the plate is not installed on the threaded flange.

2. The shower drain assembly of claim **1**, wherein the first friction tab is configured to not frictionally engage the feature of the upper interior surface when the protective cover is installed directly onto the threaded flange.

3. The shower drain assembly of claim **1**, wherein the plate includes at least a third friction tab configured to frictionally engage the feature of the upper interior surface when the plate is installed onto the threaded flange.

4. The shower drain assembly of claim **1**, wherein the feature of the upper interior surface comprises a groove.

5. The shower drain assembly of claim **4**, wherein the second friction tab is configured to snap into the groove when the protective cover is installed onto the threaded flange without the plate and not to snap into the groove when the protective cover is installed onto the plate and the plate is installed onto the threaded flange.

6. The shower drain assembly of claim **1**, wherein the first friction tab comprises a first hook portion that faces radially inward and the second friction tab comprises a second hook portion that faces radially outward.

7. The shower drain assembly of claim **6**, wherein the first friction tab is shorter than the second friction tab.

8. A shower drain assembly comprising:
- a receptor including:
  - an upper portion; and

a lower portion couplable to a drain pipe; and
a threaded flange including:
a flange portion with a top surface;
a threaded portion extending opposite the top surface, the threaded portion configured to thread into the upper portion of the receptor; and
an upper interior surface;
a plate configured to cover the flange portion when installed on the threaded flange; and
a protective cover including at least:
a top surface;
a bottom surface;
a first pair of friction tabs extending from the bottom surface and configured to frictionally engage at least one of the plate or a feature of the upper interior surface when the plate is installed on the threaded flange; and
a second pair of friction tabs extending from the bottom surface and configured to fictionally engage the feature of the upper interior surface when the plate is not installed on the threaded flange.

9. The shower drain assembly of claim **8**, wherein each of the first pair friction tabs includes a first hook portion and each of the second pair of friction tabs includes a second hook portion, and wherein the first hook portion faces radially inward and the second hook portion faces radially outward.

10. The shower drain assembly of claim **8**, wherein each of the first pair of friction tabs is configured to not frictionally engage the feature of the upper interior surface when the protective cover is installed directly onto the threaded flange.

11. The shower drain assembly of claim **8**, wherein the plate includes at least a third pair of friction tabs configured to frictionally engage the feature of the upper interior surface when the plate is installed onto the threaded flange.

12. The shower drain assembly of claim **8**, wherein each of the first pair friction tabs includes a first hook portion and each of the second pair of friction tabs includes a second hook portion, and wherein the first hook portion extends a different distance from the bottom portion than the second portion extends from the bottom portion.

13. The shower drain assembly of claim **12**, wherein each of the first pair friction tabs includes a first hook portion and each of the second pair of friction tabs includes a second hook portion, and wherein the first hook portion faces radially outward and the second hook portion faces radially outward.

14. The shower drain assembly of claim **8**, wherein the feature of the upper interior surface comprises a groove.

15. The shower drain assembly of claim **14**, wherein each of the second pair of friction tabs is configured to snap into the groove when the protective cover is installed onto the threaded flange without the plate and not to snap into the groove when the protective cover is installed onto the plate and the plate is installed onto the threaded flange.

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