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Inventor(s)

Freudenberger; Robert Eugene

WHOLE HOUSE WATER FILTER GASKET AND ALIGNMENT DEVICE

Abstract

A water filter gasket is configured as a flat structure having a gasket element and cartridge support elements extending from the gasket element towards a central axis. The gasket element provides a secure mating surface between the filter housing and inlet/outlet valve. The cartridge support elements provide an alignment aid during the attachment of the filter housing to the inlet/outlet valve. For example, the cartridge support elements aid in aligning the water filter cartridge along a central, longitudinal axis when placed into the filter housing. Such alignment mitigates the need to balance the filter cartridge within the filter housing while attaching the filter housing to the inlet/outlet valve.

Inventors: Freudenberger; Robert Eugene (Woodstock, CT)

Applicant: Freudenberger; Robert Eugene (Woodstock, CT)

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Background/Summary

RELATED APPLICATIONS [0001] This patent application claims the benefit of U.S. Provisional Application No. 63/556,182 filed on Feb. 21, 2024, entitled “Whole House Water Filter Gasket and Alignment Device,” the contents and teachings of which are hereby incorporated by reference in their entirety.

BACKGROUND

[0002] Water sources for drinking water can include varying amounts of dissolved chemicals and suspended particulate materials. In order to improve water quality, end users, such as residences and businesses, typically use water filtration systems to mitigate these contaminants and particulates.

[0003] Over time, as a water filtration system operates, a water filter within the system can become loaded or clogged with particulates, thereby mitigating water flow through the system. As such, the water filter must be periodically changed. For example, a whole house water system typically includes a filter assembly having a filter housing, valve, and a filter disposed within the housing. During a replacement procedure for the filter, the end user typically disconnects the filter housing from the valve, removes the used water filter from the housing, replaces the used water filter with a new, unused filter, and reattaches the housing to the valve. By replacing the used water filter, the end user can ensure that clean water is supplied to the house.

SUMMARY

[0004] Conventional water filtration assemblies suffer from a variety of deficiencies. For example, whole house water filter assemblies typically include an inlet/outlet valve disposed between a water source and a house's water outlet, a filter, and a filter housing which secures to the valve and contains the filter. These conventional water filter assemblies utilize an o-ring disposed within a groove between a filter housing and valve to mitigate water leakage from the assemblies during operation. During assembly, a user disposes the o-ring in a groove and places the filter into the housing. However, the relative geometries of the filter housing and filter requires the user to balance the filter at the center of the filter housing while aligning the filter with the valve as well as while engaging and rotating threads of the filter housing with the threads of the valve. With this arrangement, the filter may shift in the filter housing and prevent the aperture of the filter to properly align with an engagement member of the valve. As such, the user may be required to make multiple attempts to align the filter aperture with the valve engagement member to secure the filter housing to the valve.

[0005] Further, during these attempts, the o-ring can become dislodged from the groove. Following attachment of the filter housing to the valve, once water pressure is applied to the water filter assembly, the dislodged o-ring can cause the filter to leak. As such, the user must reassemble the filter housing to the valve while manipulating the o-ring and balancing the filter within the filter housing until any leaks are halted.

[0006] By contrast to conventional water filtration assemblies, embodiments of the present innovation relate to a whole house water filter gasket and alignment device. In one arrangement, the water filter gasket is configured as a flat structure having a gasket element and cartridge support elements extending from the gasket element toward a central axis. The gasket element provides a secure mating surface between a filter housing and inlet/outlet valve. The cartridge support elements aid in alignment of a water filter cartridge during the attachment of the filter housing to the inlet/outlet valve. For example, the cartridge support elements aid in aligning a central axis of

an aperture of the water filter cartridge with a longitudinal axis of a filter engagement member of the inlet/outlet valve and securing the water filter cartridge along a central, longitudinal axis of the filter housing. Such alignment and securing mitigates the need to balance the water filter cartridge within the filter housing while attaching the filter housing to the inlet/outlet valve, as found in conventional filter assemblies.

[0007] The water filter gasket can be manufactured from a variety of materials. For example, the water filter gasket can be manufactured from an elastomeric material configured to provide alignment of the water filter cartridge along the central, longitudinal axis and to bend along the longitudinal axis in high water flow situations. This mitigates disturbance of water flow or pressure drop in the whole house water filter assembly during operation and maintains maximum water flow as needed. As such, because of the firmness/softness and shape of the water filter gasket, the water filter gasket replaces the o-ring in conventional whole house water filter assemblies while maintaining a fluid seal between the filter housing and inlet/outlet valve.

[0008] Embodiments of the innovation relate to a water filter gasket, comprising a gasket element and a set of cartridge support elements extending from the gasket element, the set of cartridge support elements configured to secure a water filter cartridge within a filter housing of a whole house water filter assembly.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The foregoing and other objects, features and advantages will be apparent from the following description of particular embodiments of the innovation, as illustrated in the accompanying drawings in which like reference characters refer to the same parts throughout the different views. The drawings are not necessarily to scale, emphasis instead being placed upon illustrating the principles of various embodiments of the innovation.

[0010] FIG. 1 illustrates a side sectional and partially exploded view of a whole house water filter assembly having a water filter gasket, according to one arrangement.

[0011] FIG. 2 illustrates a top view of the water filter gasket of FIG. 1, according to one arrangement.

[0012] FIG. 3 illustrates a top view of the water filter gasket installed within a filter housing relative to a water filter cartridge, according to one arrangement.

[0013] FIG. 4 is a perspective view of the water filter gasket installed within the filter housing relative to the water filter cartridge, according to one arrangement.

[0014] FIG. 5 illustrates a top view of a water filter gasket, according to one arrangement.

DETAILED DESCRIPTION

[0015] By contrast to conventional water filtration assemblies, embodiments of the present innovation relate to a whole house water filter gasket and alignment device. In one arrangement, the water filter gasket is configured as a flat structure having a gasket element and cartridge support elements extending from the gasket element. The gasket element provides a secure mating surface between a filter housing and inlet/outlet valve. The cartridge support elements aid in alignment of a water filter cartridge during the attachment of the filter housing to the inlet/outlet valve. For example, the cartridge support elements aid in aligning a central axis of an aperture of the water filter cartridge with a longitudinal axis of a filter engagement member of the inlet/outlet valve and securing the water filter cartridge along a central, longitudinal axis of the filter housing. Such alignment and securing mitigates the need to balance the water filter cartridge within the filter housing while attaching the filter housing to the inlet/outlet valve, as found in conventional filter assemblies.

[0016] FIG. 1 illustrates a whole house water filter assembly 10, according to one arrangement.

The whole house water filter assembly **10** includes a filter housing **14**, an inlet/outlet valve or distributor **12**, a water filter cartridge **16**, and a water filter gasket **18**.

[0017] The inlet/outlet valve **12** includes a water inlet **20**, a water outlet **22**, a vent **24** configured to remove pressure within the assembly **10** during maintenance, and a filter engagement member **25**. The water inlet **20** is configured to be coupled to a water source while the water outlet **22** is configured to be coupled to a water dispenser in a house or business, such as a water faucet.

[0018] The water filter cartridge **16** is configured to be coupled with the filter engagement member **21** of the inlet/outlet valve **12**. For example, a first end of a filter channel **26** defined by the water filter cartridge **16** can be disposed on the filter engagement member **21** and held longitudinally in place relative to the inlet/outlet valve **12** by the filter housing **14**.

[0019] During operation, as water enters the water inlet **20** along flow direction **100**, the water flows past the water filter gasket **18** into the filter housing **14** along flow direction **102**. As the filter housing **14** becomes filled with water, the water travels along flow direction **104** into the water filter cartridge **16**. As the water flows into the water filter cartridge **16**, the water enters the filter channel **26** defined by the water filter **16**, and travels within the filter channel **26** along flow direction **106** and enters the filter engagement member **21** of the inlet/outlet valve **12**. From the filter engagement member **21**, the water travels along flow direction **108** and exits the inlet/outlet valve **12** via the water outlet **22**. With such flow, water entering the whole house water filter assembly **10** is filtered by the water filter cartridge **16** to remove particulate and contaminants from the water prior to being provided to the house or business.

[0020] The filter housing **14** is configured to contain the water filter cartridge **16** and to secure the water filter cartridge **16** to the inlet/outlet valve **12**. In one arrangement, the inlet/outlet valve **12** and the filter housing **14** can include a sealing assembly **25** configured to couple the valve **12** and housing **14**. For example, the sealing assembly **25** can define a first set of threads disposed about an outer periphery of an external surface of the filter housing **14** which mesh with second set of threads disposed about and defined by an inner periphery of an internal surface of the inlet/outlet valve **12**. Further a base of the filter housing **14** can include a filter engagement member **15** configured to insert within a second end of the water filter channel **26** defined by the water filter cartridge **16**. During assembly, as a user utilizes the sealing assembly **25** to couple the inlet/outlet valve **12** with the filter housing **14**, the filter engagement member **15** generates a longitudinal load against the second end of the water filter channel **26** to secure the water filter cartridge **16** between the inlet/outlet valve **12** and the filter housing **14**.

[0021] As indicated, in FIG. **1**, the water filter gasket **18** is disposed between the inlet/outlet valve **12** and the filter housing **14**. With additional reference to FIG. **2**, the water filter gasket **18** is configured as a flat, disc-shaped structure having a gasket element **30** and cartridge support elements **32** extending from the gasket element **30**.

[0022] The water filter gasket **18** can be configured with a variety of geometries. For example, the water filter gasket **18** can define a generally disc-shaped or circular structure having a thickness **55** of between about 0.125 inches and 0.25 inches. Further, with the presence of the gasket element **30** and cartridge support elements **32**, the water filter gasket **18** can define a first inner diameter **50**, such as between opposing cartridge support elements **32**, of between about 2.4 inches and 2.6 inches, a second inner diameter **52**, such as between opposing gasket element **30**, of between about 3.5 inches and 3.4 inches, and an outer diameter **54** of between about 4.1 inches and 4.3 inches.

[0023] The water filter gasket **18** can be manufactured from a variety of materials. In one arrangement, the water filter gasket **18** can be manufactured from an elastomeric material, such as a silicon rubber material or ethylene propylene diene monomer (EPDM) rubber. Accordingly, the water filter gasket **18** can include a variety of durometer values. For example, the elastomeric material can have a durometer value of between about 50 and 80. In another example, the elastomeric material can have a durometer value of between about 70 and 80. In one arrangement, the water filter gasket **18** can be manufactured from a nylon material.

[0024] The gasket element **30** defines an outer periphery of the water filter gasket **18** and is configured to seal a contact surface between the filter housing **14** and inlet/outlet valve **12** to mitigate leakage of water during operation of the whole house water filter assembly **10**. For example, during an assembly procedure, the filter housing **14** can compress the gasket element **30** against an outer periphery of the inlet/outlet valve **12**. With such a configuration of the material properties and shape of the gasket element **30** of the water filter gasket **18**, the gasket element **30** provides a relatively tight fluid seal between the filter housing **14** and the inlet/outlet valve **12** that is less prone to leakage than a conventional o-ring. As such, the water filter gasket **18** can replace the o-ring in conventional whole house water filter assembly **10**.

[0025] The cartridge support elements **32** of the water filter gasket **18** extend from the gasket element **30** towards a water filter cartridge **16** and are configured to secure the water filter cartridge **16** in a central location within the filter housing **14** and align an aperture **31** of the water filter cartridge **16** with the filter engagement member **25** of the inlet/outlet valve **12** during assembly. As such, as a user engages the sealing assembly **25** of the filter housing **14** and the inlet/outlet valve **12** to move the housing along direction **120** as shown in FIG. 2, the first end of the filter channel **26** can correspondingly engage the filter engagement member **21**. Such alignment allows for ease of reattachment of the filter cartridge **16** to the inlet/outlet valve **12** and the filter housing **14** to the inlet/outlet valve **12** following replacement of the water filter cartridge **16**, without the need for the user to balance the filter cartridge **16** within the filter housing **14**.

[0026] As shown, each of the cartridge support elements **32** extend from the outer periphery of the gasket element **30** toward a central or longitudinal axis **28** of the of the water filter gasket **18**. While the water filter gasket **18** can include any number of cartridge support elements **32**, in one arrangement, the water filter gasket **18** includes four cartridge support elements **32** distributed about the gasket element **30** at 90° increments, as shown in FIG. 2. Further, each of the cartridge support elements **32** define a radial spacing **56** with adjacent cartridge support elements **32**. With such radial spacing **56**, each of the cartridge support elements **32** can flex along and relative to the longitudinal axis **28** of the water filter gasket **18** either during installation or operation.

[0027] With additional reference to FIGS. 3 and 4, the cartridge support elements **32** are further configured to align a longitudinal axis **29** of the water filter cartridge **16** within the filter housing **14** along a central, longitudinal axis **27** of the housing **14**. For example, during an installation procedure, as a user places the water filter cartridge **16** within the filter housing **14**, the user can dispose the water filter gasket **18** about an outer periphery of the filter cartridge **16** such that the cartridge support elements **32** contact an outer periphery of the water filter cartridge **16**. With such placement, the longitudinal axis **29** of the water filter cartridge **16** is substantially colinear with the longitudinal axis **28** of the water filter gasket **18**. As the user inserts the water filter cartridge **16** and water filter gasket **18** within the filter housing **14**, the cartridge support elements **32** secure the water filter cartridge **16** within the filter housing **14** to maintain the longitudinal axis **29** of the water filter cartridge **16** as substantially colinear with the longitudinal axis **27** of the filter housing **14**. In turn, such positioning of the water filter cartridge **16** within the filter housing **14** aligns the aperture **31** of the water filter cartridge **16** with the filter engagement member **25** of the inlet/outlet valve **12**. As the user secures the filter housing **14** to the inlet/outlet valve **12** via the sealing assembly **25**, the cartridge support elements **32** of the water filter gasket **18** maintain the alignment of the water filter cartridge **16** relative to the filter engagement member **25** of the inlet/outlet valve **12**.

[0028] The water filter gasket **18**, thus, mitigates the need to physically balance the water filter cartridge **16** within the filter housing **14** while attaching the filter housing **14** to the inlet/outlet valve **12**, as found in conventional water filtration assemblies. As such, the water filter gasket **18** provides a smooth, quick, and convenient method of replacing a water filter in a whole house water filter assembly **10**.

[0029] Additionally, the water filter gasket **18** can mitigate disturbance of water flow or pressure

drop in the whole house water filter assembly **10** during operation and maintain maximum water flow as needed. For example, the cartridge support elements **32** are configured to define a set of flow channels **40** relative to the water filter cartridge **16**. The flow channels **40** allow water to flow from the inlet **20** of the inlet/outlet valve **12** past the water filter gasket **18** and into the filter housing **14**. Additionally, in the case where the water filter gasket **18**, including the cartridge support elements **32**, is manufactured from an elastomeric material, during operation, the cartridge support elements **32** can bend (e.g., into the page of FIG. 2 along longitudinal axis **28**) in relatively high-volume water flow situations to maintain water flow through the water filter assembly **10**, as needed.

[0030] In one arrangement, the water filter gasket **18** can include a second gasket element **60** disposed about an inner periphery of the cartridge support elements **32**. For example, with reference to FIG. 5, second gasket element **60** is configured as a circular structure that extends from each of the four cartridge support elements **32** toward the longitudinal axis **28** of the water filter gasket **18**. While the second gasket element **60** can be configured with a variety of diameters, in one arrangement, the second gasket element **60** defines an inner diameter **62** of between about 2.5 inches and 2.6 inches. Further, the second gasket element **60** defines a set of flow channels **64** relative to the cartridge support elements **32** and gasket element **30**. The flow channels **64** allow water to flow from the inlet **20** of the inlet/outlet valve **12** past the water filter gasket **18** and into the filter housing **14**.

[0031] The second gasket element **60** is configured to maintain alignment of the water filter gasket **18** relative to the filter housing **14** during an installation procedure. For example, during installation, a user places the water filter gasket **18** of FIG. 5 over a water filter cartridge **16** and inserts the cartridge **16** into a filter housing **14**. The second gasket element **60** aligns and maintains the longitudinal axis **29** of the water filter cartridge **16** as substantially colinear with the longitudinal axis **27** of the filter housing **14**. As the user installs the filter housing **14** on the inlet/outlet valve **12**, the second gasket element **60** further maintains the alignment of the gasket element **30** relative to the filter housing **14**.

[0032] As provided above, the water filter gasket **18** is configured with cartridge support elements **32** that can contact the outer periphery of the water filter cartridge **16**. Such a description is by way of example only. In one arrangement, one or more of the cartridge support elements **32** defines a gap or space relative to the outer periphery of the water filter cartridge **16**. Such spacing can allow for ease of removal of the water filter gasket **18** from a used water filter cartridge **16** and installation of a new cartridge.

[0033] As provided above, the water filter gasket **18** is used as part of whole house water filter assembly **10**. Such a description is by way of example only. In one arrangement, the water filter gasket **18** can be used in a product where a filter cartridge is placed inside a filter body and there are limited alignment provisions during reassembly. For example, the gasket **18** can be utilized in an oil filter assembly that uses a cartridge filter.

[0034] While various embodiments of the innovation have been particularly shown and described, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the innovation as defined by the appended claims.

Claims

1. A water filter gasket, comprising: a gasket element; and a set of cartridge support elements extending from the gasket element, the set of cartridge support elements configured to secure a water filter cartridge within a filter housing of a whole house water filter assembly.
2. The water filter gasket of claim 1, wherein the gasket element defines an outer periphery of the water filter gasket and is configured to seal a contact surface between the filter housing and an

inlet/outlet valve.

3. The water filter gasket of claim 1, wherein each cartridge support element of the set of cartridge support elements extends from the gasket element toward a longitudinal axis of the of the water filter gasket.

4. The water filter gasket of claim 1, wherein each cartridge support element of the set of cartridge support elements defines a radial spacing with an adjacent cartridge support element.

5. The water filter gasket of claim 1, wherein the cartridge support elements are configured to align an aperture of a filter channel defined by the water filter cartridge with a filter engagement member of an inlet/outlet valve of the whole house water filter assembly.

6. The water filter gasket of claim 1, wherein the gasket element and the set of cartridge support elements are configured to define a set of flow channels relative to the water filter cartridge, the set of flow channels configured to allow water to flow from an inlet of an inlet/outlet valve of the whole house water filter assembly and into the filter housing.

7. The water filter gasket of claim 1, further comprising a second gasket element disposed about an inner periphery of the set of cartridge support elements.

8. The water filter gasket of claim 7, wherein the second gasket element defines a set of flow channels relative to the cartridge support elements and the gasket element, the set of flow channels configured to allow water to flow from an inlet of an inlet/outlet valve of the whole house water filter assembly and into the filter housing.

9. A whole house water filter assembly, comprising: a filter housing; a water filter cartridge disposed within the filter housing; and a water filter gasket disposed on the water filter cartridge, the water filter gasket comprising: a gasket element; and a set of cartridge support elements extending from the gasket element, the set of cartridge support elements configured to secure the water filter cartridge within the filter housing of the whole house water filter assembly.

10. The whole house water filter assembly of claim 9, wherein the gasket element defines an outer periphery of the water filter gasket and is configured to seal a contact surface between the filter housing and an inlet/outlet valve.

11. The whole house water filter assembly of claim 9, wherein each cartridge support element of the set of cartridge support elements extends from the gasket element toward a longitudinal axis of the of the water filter gasket.

12. The whole house water filter assembly of claim 9, wherein each cartridge support element of the set of cartridge support elements defines a radial spacing with an adjacent cartridge support element.

13. The whole house water filter assembly of claim 9, wherein the cartridge support elements are configured to align an aperture of a filter channel defined by the water filter cartridge with a filter engagement member of an inlet/outlet valve of the whole house water filter assembly.

14. The whole house water filter assembly of claim 9, wherein the gasket element and the set of cartridge support elements are configured to define a set of flow channels relative to the water filter cartridge, the set of flow channels configured to allow water to flow from an inlet of an inlet/outlet valve of the whole house water filter assembly and into the filter housing.

15. The whole house water filter assembly of claim 9, further comprising a second gasket element disposed about an inner periphery of the set of cartridge support elements.

16. The whole house water filter assembly of claim 15, wherein the second gasket element defines a set of flow channels relative to the cartridge support elements and the gasket element, the set of flow channels configured to allow water to flow from an inlet of an inlet/outlet valve of the whole house water filter assembly and into the filter housing.
