SINK FLANGE AND COLLAR ASSEMBLY FOR A FOOD WASTE DISPOSER

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ABSTRACT
A sink flange and collar assembly for a food waste disposer includes a sink flange having a tubular body portion and an annular flange transversely extending from the tubular body portion. An outer radial surface of the tubular body portion having at least one first dimple extending outwardly from the outer radial surface. A collar has a dimple attachment recess adapted to slidably receive the at least one first dimple, and a dimple insertion track transversely oriented to the dimple attachment recess to releasably engage with the at least one dimple to releasably engage the collar to the sink flange.
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CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a divisional of U.S. patent application Ser. No. 12/133,585 filed on Jun. 5, 2008, which claims the benefit of U.S. Provisional Application No. 60/942,275, filed on Jun. 6, 2007. The entire disclosure of the above applications are incorporated herein by reference.

FIELD

[0002] The present disclosure relates to food waste disposers and a sink flange and collar assembly for a food waste disposer.

BACKGROUND

[0003] The statements in this section merely provide background information related to the present disclosure and may not constitute prior art.

[0004] Commonly known food waste disposers use screws as a primary mounting means. A disadvantage of screws or fasteners is they can create a direct path for vibration from the disposer to the sink and therefore transfer operating noise or vibration. Other common mounting systems use an all-plastic sink-flange and connector collar mounting. A plastic sink-flange wall has several disadvantages as it can be too thick for inclusion of magnetic switching devices, and plastic is not as impervious to household chemicals often brought into contact with the disposer as the wall of a stainless steel sink-flange. In addition, although plastic is not necessarily less expensive than stainless steel, to many consumers it can create a less desirable appearance and can appear to be less robust.

SUMMARY

[0005] A sink flange and collar assembly for a food waste disposer includes a sink flange having a tubular body portion and an annular flange transversely extending from the tubular body portion. An outer radial surface of the tubular body portion having at least one first dimple extending outwardly from the outer radial surface. A collar has a dimple attachment recess adapted to slidably receive the at least one first dimple, and a dimple insertion track transversely oriented to the dimple attachment recess to releasably engage the collar to the sink flange.

[0006] Further areas of applicability will become apparent from the description provided herein. It should be understood that the description and specific examples are intended for purposes of illustration only and are not intended to limit the scope of the present disclosure.

DRAWINGS

[0007] The drawings described herein are for illustration purposes only and are not intended to limit the scope of the present disclosure in any way.

[0008] FIG. 1 is a top perspective view of a mounting assembly and magnetic strainer top according to several embodiments of a mount system for a food waste disposer of the present disclosure;

[0009] FIG. 2 is a cross sectional side elevational view of the mounting assembly of FIG. 1;

[0010] FIG. 3 a cross sectional side elevational view similar to FIG. 2, further showing reed switches and a magnetic strainer;

[0011] FIG. 4 is a side perspective view of a dimpled sink-flange of the present disclosure;

[0012] FIG. 5 is a top plan view top view of the sink-flange of FIG. 4;

[0013] FIGS. 6a through 6c are perspective views showing a sink-flange assembly, an individual sink-flange, and an isolator-mounting gasket with gasket clamps of the present disclosure;

[0014] FIGS. 7a through 7b are a side elevational cross sectional view, a top plan view, and a partial cross sectional side elevational view of an isolator mounting gasket of the present disclosure;

[0015] FIG. 8 is a top perspective view of a threaded nut collar, with grip ribs of the present disclosure;

[0016] FIGS. 9a through 9g further show the threaded nut collar of FIG. 8;

[0017] FIG. 10 is a top perspective view of a threaded reed collar with a reed switch, dimple lock bayonet, and wire of the present disclosure;

[0018] FIGS. 11a through 11h, and 11f further show the threaded reed collar of FIG. 10;

[0019] FIG. 12 is a bottom perspective view of a mounting assembly of the present disclosure;

[0020] FIGS. 13a through 13f show a reed switch connector assembly and switching diagram of the present disclosure;

[0021] FIG. 14 is a side perspective view of a magnetic strainer of the present disclosure;

[0022] FIGS. 15a through 15f further show the magnetic strainer assembly of FIG. 14;

[0023] FIGS. 16a through 16h, and 16f further show the sink-flange of FIG. 4;

[0024] FIGS. 17a through 17h, 17j, 17k, and 17n further show the magnetic strainer of FIG. 14;

[0025] FIGS. 18a through 18l, and 18j further show the sink-flange of FIG. 4;

[0026] FIG. 19 is a side elevational view of an assembly of the of threaded nut collar of FIG. 8 and the sink flange assembly of FIG. 6a;

[0027] FIGS. 20a through 20d show a sink-flange gasket of the present disclosure;

[0028] FIG. 21 is a top perspective view of the threaded reed collar of FIG. 10;

[0029] FIG. 22 is a top perspective view of a snap-on wire and switch retention ring of the present disclosure;

[0030] FIG. 23 is a cross sectional front elevational view of an installed mounting assembly without the magnetic strainer according to several embodiments of the present disclosure;

[0031] FIG. 24 is a cross sectional front elevational view of a sink flange of the mounting assembly of FIG. 23;

[0032] FIG. 25 is a front perspective view of the installed mounting assembly of FIG. 23;

[0033] FIG. 26 is a cross sectional front elevational view of a subassembly of the sink flange of FIG. 24 installed using a threaded collar nut to a sink base;

[0034] FIG. 27 is a cross sectional front elevational view of the subassembly of FIG. 26 further showing installation of a food waste disposer flange mount;
FIG. 28 is the cross sectional front elevational view of FIG. 27 further showing installation of a mount retaining ring; and

FIG. 29 is a cross sectional front elevational view of the subassembly of FIG. 28 further showing installation of a food waste disposer attachment body flange.

DETAILED DESCRIPTION

The following description is merely exemplary in nature and is not intended to limit the present disclosure, application, or uses. It should be understood that throughout the drawings, corresponding reference numerals indicate like or corresponding parts and features.

Referring generally to FIGS. 1, 5, and 6a-6b, a mount system 2 includes a mount system sink-flange 4 with a plurality of small projection features or dimples 6. The dimples 6 are of two types, convex or outward protrusions 8 extending outwardly from an outer radial surface 10, and conave or inward protrusions 12 formed in inner radial surface 11 of a tubular section 14 of the sink-flange 4.

Referring generally to FIGS. 2, 3, 4, 6a-6c, 7a-7c, 18a-18b and 18j, and 19, the sink-flange 4 of mount system 2 has a radially recessed hook feature 16 for frictional attachment of an isolator mounting gasket 18. Isolator mounting gasket 18 is attached with one or more clamps 20 such as band clamps. A peripheral slot 21 is created in mounting gasket 18 to align each clamp 20.

Referring generally to FIGS. 8, 9a-9g, 10, 12, 19, and 21 mount system 2 also includes a threaded collar nut 22 that threads onto a threaded reed switch collar 24 for tightening and securing the assembly of the mount system 2 onto a bottom opening of a sink 26. The sink 26 can be made from a material such as but not limited to steel, iron, ceramic, or the like.

Referring generally again to FIGS. 8, 10, and 12, threaded collar nut 22 further includes a top flat surface or flange 28 and multiple grip ribs 30 on an opposed bottom surface 32 for strengthening and to help tighten the threaded collar nut 22 to reed switch collar 24 by hand or with a special wrench tool (not shown). Perpendicular to the top flat surface or flange 28 of threaded collar nut 22 is an internal tubular section 34 of the threaded collar nut 22 having a plurality of strong machine threads 36 for threaded attachment to the threaded reed switch collar 24.

Referring generally to FIGS. 2, 3, 4, 5, 8, 9g, 10, and 11a-11b, 11j, and 21, the threaded reed switch collar 24 has molded into an inside tubular geometry a plurality of bayonet type dimple attachment recesses 38, 38’ molded in and matching the geometry and the plurality of the outward protrusions 8 of the sink-flange 4 as a means of securely attaching the threaded reed switch collar 24 to the sink-flange 4. The threaded reed switch collar 24 includes at least two bayonet dimple insertion tracks 40, 40’ that are transversely oriented and lead into individual ones of the bayonet type dimple attachment recesses 38, 38’. The bayonet dimple insertion tracks 40, 40’ are non-symmetrical (meaning they are not oriented at even angular intervals such as 180 degree intervals).

Referring generally to FIGS. 10, 11a-11b, 13a-13d, and 14 the threaded reed switch collar 24 also has molded into its external cylindrical geometry a plurality of strong machine style threads 44 for attachment of the machine style threads of threaded collar nut 22. The threaded reed switch collar 24 also includes a plurality of internally placed magnetic reed switches 46 and reed switch wires 48, which are assembled into the reed switch collar 24, and correspond with and activate by “substantial” alignment with magnets 50 in the magnetic strainer 42. Substantial alignment occurs with approximately 50% or more overlap of the individual magnets 50 with individual ones of the magnetic reed switches 46.

Referring generally to FIGS. 3, 10, 11a-11h, and 11j, 13a-13d, 14, and 15a-15e the quantity and geometry of the magnets 50 and reed switch positions 52 are such that by the rotation of the magnetic strainer 42 in its appropriate internal dimple channel 54, the reed switches 46 will be activated either to an “on” position 56 or an “off” position 58 as pairs, providing a redundant switch as a security device. This switching can be designed as a single or as multiple modes of operation by utilizing multiple reed switches 46 and geometries. A resilient material bumper 60 is provided acting as a detent to releasably hold the “on” position 56 to prevent normal vibration of the waste disposer from inadvertently shutting off the unit.

Referring generally to FIGS. 2, 3, 14, 15a-15e, 16a-16b, and 16j, and 17a-17b, 17j-17k, and 17m-17n the magnetic strainer 42 includes channels 54 about a strainer periphery 62, which correspond to the geometry of the inner dimples or inward protrusions 12 of sink-flange 4, allowing the sink-flange 4 to track in engineered locations or channels and stop in predetermined tracks. These locations are pre-designed magnet 50 and reed switch 46 “on” 56 or “off” 58 positions.

Referring generally to FIGS. 2, 3, 14, 15a-15e, and 17a-17b, 17j-17k, and 17m-17n the magnetic strainer 42 includes one or more parts including a top 64 and a bottom 66 that can snap together using one or more detachable engagement tabs 68 and can snap apart to help make cleaning easier. The magnetic strainer 42 has at least two dimple insertion tracks 70 that are non-symmetrical which allow the magnetic strainer 42 to be inserted into the sink-flange 4 into only one pre-designed location orientation.

Referring generally to FIGS. 2, 19, and 20, a sink flange gasket 72 of a resilient material includes a plurality of waves or ridges 74 in opposed surfaces to create a fluid seal. The sink flange gasket 72 can be used to mount the sink-flange 4 to provide a fluid seal and to further isolate a noise and vibration path from the food waste disposer 76 shown in FIG. 19 to the sink 26.

Referring generally to FIGS. 10, 11, 21, and 22, a snap ring 78 snaps engages into a circular shaped channel 80 of the threaded reed switch collar 24. Snap ring 78 includes a plurality of extensions 82 which engage with individual ones of the reed switches 46 to retain the reed switches 46. A reed switch mounting post 84 extending from an inner wall 85 of threaded reed switch collar 24 is also provided at each mounting location of the reed switches 46. Channel 80 also provides a routing path for the individual ones of the reed switch wires 48 of the reed switches 46, and a plurality of slots 86 are created in threaded reed switch collar 24 to permit exit of the reed switch wires 48. As best seen in FIG. 22, a plurality of notches 88 created in snap ring 78 are alignable with individual ones of the slots 86 to provide additional clearance for the reed switch wires 48.

Referring to FIG. 23, another embodiment of a food waste disposer mounting system 90 reduces noise transmission of motor noise of the disposer via a path to the sink flange. A polymeric material sink flange 92 is positioned in a sink 94 (only partially shown). A washer 96 positioned above an upper sink face 98 is compressed against the sink face 98.
by threadably engaging a threaded collar nut 100 which engages a plurality of threads 102 created on an outer tubular body portion 104 of sink flange 92. A flange mount 106 is slidably received over outer tubular body portion 104 below the threads 102 and a mount retaining ring 108 is located below the flange mount 106. Mount retaining ring 108 can be diametrically spread to pass over an extending lip 110 formed at a free end 112 of the sink flange 92. Mount retaining ring 108 is frictionally received within an annular groove 114 formed above and proximate to extending lip 110. According to additional embodiments, a cladding ring 116 of a metal material such as a stainless steel can be shape-formed corresponding to a shape of and frictionally coupled over an annular flange 118 of sink flange 92.

[0050] Referring to FIG. 24, sink flange 92 includes outer tubular body portion 104 which is homogeneously connected to annular flange 118. The plurality of threads 102 are co-molded with and extend outwardly from outer tubular body portion 104. According to several embodiments, threads 102 are left-handed threads. Annular groove 114 has an outward facing concave geometry and may include a convex-shaped portion 120 extending inwardly from an inner bore wall 122 of outer tubular body portion 104.

[0051] Referring to FIG. 25 and again to FIG. 23, after flange mount 106 is positioned and retained by installation of mount retaining ring 108, a disposer attachment body flange 124 connected to a disposer unit 126 (only partially shown) is rotated in a clockwise rotation “Z” to engage disposer unit 126 to disposer mounting system 90 and sink 94. The clockwise rotation of disposer attachment body flange 124 acts opposite to the rotation of threaded collar nut 100 so threaded collar nut 100 is not loosened by installation of disposer unit 126. A ring 128 extending radially from disposer attachment body flange 124 can contact an arm 130 radially extending from flange mount 106 to limit rotational travel of disposer attachment body flange 124 with respect to flange mount 106.

[0052] Referring to FIG. 26, the installation sequence is as follows. Sink flange 92 is aligned within an opening 132 in sink 94 so that annular flange 118 contacts an upward facing surface 134 of washer 96. Washer 96 has an annular bore that allows washer 96 to be slid outside of threads 102 until washer 96 abuts annular flange 118. Threaded collar nut 100 is threaded onto threads 102 and rotated until washer 96 is compressed against the sink face 98.

[0053] Referring to FIGS. 27 and 28, the flange mount 106 is then slidably pushed over extending ring 110 and over outer tubular body portion 104 up to the threads 102 until flange mount 106 abuts or is positioned proximate to the threaded collar 100. While temporarily holding flange mount 106 in position, mount retaining ring 108 is then elastically diametrically spread to slide past extending ring 110 at free end 112 of the sink flange 92 and seats within by biasing into frictional contact within annular groove 114. A rolled portion 136 of mount flange 106 which defines an inner diameter smaller than a diameter of mount retaining ring 108 thereafter retains flange mount 106. Mount retaining ring 108 can be made from a metal material to provide shear load support to prevent removal of flange mount 106 by gravity/weight load induced by the disposer unit on the sink flange 92.

[0054] Referring to FIG. 29 and again to FIG. 25, a disposer (not shown) is positioned abutting flange mount 106. The disposer attachment body flange 124 is then rotatably engaged with flange mount 106. Disposer attachment body flange 124 is rotated in a clockwise direction to tighten disposer attachment body flange 124.

[0055] A food waste disposer mounting assembly of the present disclosure provides several advantages. The mounting assembly uses a stainless steel or plastic sink-flange with a screw-on collar system as its primary mounting system. By using a stainless steel or plastic sink-flange with a bayonet locking reed collar and screw on nut collar, a path for vibration and sound transmission to the sink is both smaller and rendered indirect. Both vibration and motor grinding noise are reduced. The system can also accommodate need switches so a stopper with magnets turns the unit into a batch-feed disposer. The use of a Stainless steel flange of the present disclosure eliminates a direct connection from the disposer to the sink, and can accommodate various sink thicknesses.

What is claimed is:

1. A sink flange and collar assembly for a food waste disposer, comprising:

- a sink flange having a tubular body portion and an annular flange transversely extending from the tubular body portion, an outer radial surface of the tubular body portion having at least one first dimple extending outwardly from the outer radial surface; and
- a collar having a dimple attachment recess adapted to slidably receive the at least one first dimple, and a dimple insertion track transversely oriented to the dimple attachment recess to releasably engage with the at least one dimple to releasably engage the collar to the sink flange.

2. The assembly of claim 1, wherein the sink flange further includes at least one second dimple extending inwardly from an inner radial surface of the tubular body.

3. The assembly of claim 2, further including at least one reed switch attached to the collar actuated by a magnet disposed in a strainer when the strainer is received in the sink flange and the magnet aligned with the reed switch.

4. The assembly system of claim 1, further comprising: a plurality of threads on the collar; and
- a collar nut threadably engageable with the plurality of threads of the collar, the collar nut and the annular flange receiving a sink body therebetween when the collar nut is threadably engaged with the collar and the tubular body portion of the sink flange is positioned in a bottom opening of a sink.

5. The apparatus of claim 1, wherein the collar nut includes a collar flange connected to a body, the body of the collar nut further having:

- an inner surface having a plurality of threads on an inner surface that threadably engage the plurality of threads of the collar, the collar nut having at least one grip rib.

6. The apparatus of claim 1, wherein the dimple insertion track is located at and extends transversely away from an end of the dimple attachment recess and prevents axial removal of the collar from the sink flange without the collar first being rotated.

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