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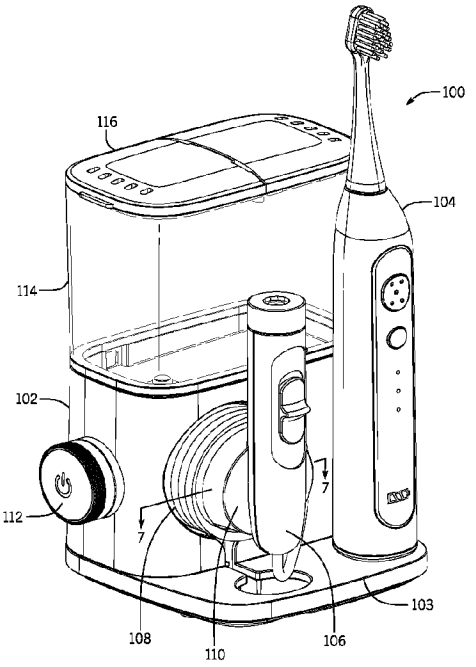
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(54) Titre : IRRIGATEUR BUCCAL A FIXATION MAGNETIQUE
(54) Title: ORAL IRRIGATOR WITH MAGNETIC ATTACHMENT



(57) Abrégé/Abstract:
The present disclosure includes embodiments directed to an oral irrigator with a magnetic attachment. The oral irrigator may include a base unit and a handle. The base unit may include a first positioning feature. The handle may include a second positioning feature corresponding with the first positioning feature of the base unit to removably couple the handle to the base unit at any one of a plurality of desired positions, such as at any one of a plurality of vertically adjacent positions, relative to the base unit. Each of the first and second positioning features may be a magnet device to magnetically couple the handle to the base unit The magnetic attachment between the handle and the base unit may automatically align the handle into a correct storage position.

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— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

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(54) Title: ORAL IRRIGATOR WITH MAGNETIC ATTACHMENT

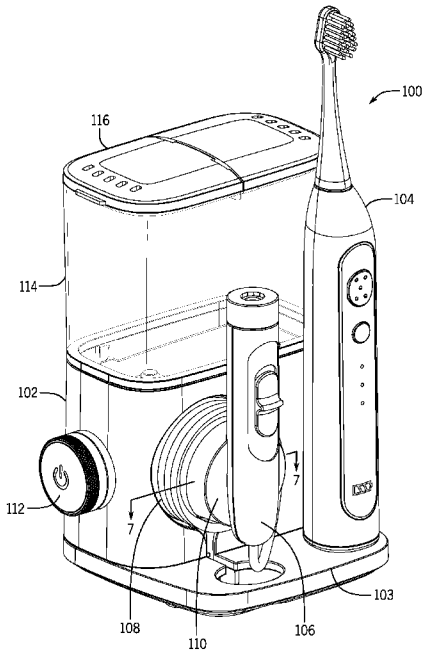


FIG. 1

(57) Abstract: The present disclosure includes embodiments directed to an oral irrigator with a magnetic attachment. The oral irrigator may include a base unit and a handle. The base unit may include a first positioning feature. The handle may include a second positioning feature corresponding with the first positioning feature of the base unit to removably couple the handle to the base unit at any one of a plurality of desired positions, such as at any one of a plurality of vertically adjacent positions, relative to the base unit. Each of the first and second positioning features may be a magnet device to magnetically couple the handle to the base unit The magnetic attachment between the handle and the base unit may automatically align the handle into a correct storage position.

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Oral Irrigator with Magnetic Attachment

TECHNICAL FIELD

[0002] The present disclosure relates generally to health and personal hygiene equipment and more particularly, to oral irrigators.

BACKGROUND

[0003] Oral irrigators typically are used to clean a user's teeth and gums by discharging a pressurized fluid stream into a user's oral cavity. The fluid impacts the teeth and gums to remove debris. Countertop oral irrigator units include a large reservoir that connects to a base unit housing a pump and other internal components. The reservoir on these types of units may be wide and cumbersome for a user to remove to refill, such that both a user's hands might be needed to manipulate the reservoir. In addition, these units may have multiple adjustment levers and knobs, which may contribute to a larger footprint. In some cases, the fluid tube coupling the base unit to the oral irrigator handle may become inadvertently tangled and have a look that is unorganized and unpleasing to a user when the irrigator handle is stored. The fluid tube may also interfere with the storage of the oral irrigator.

[0004] The information included in this Background section of the specification, including any references cited herein and any description or discussion thereof, is included for technical reference purposes only and is not to be regarded subject matter by which the scope of the disclosure is to be bound.

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SUMMARY

[0005] The present disclosure provides an oral irrigator with magnetic attachment, as described below and defined in the accompanying claims. In one embodiment, an oral irrigator assembly may include a base including a pressure assembly, a pump assembly, a motor assembly, and a cradle. The pressure assembly may include a control valve and may be fluidly connected to the pump assembly. The motor assembly may be electrically connected to the pump assembly. The oral irrigator assembly may include a reservoir with a lid adjustably coupled to the reservoir, the reservoir positioned adjacent to the base and fluidly coupled to the pressure assembly. The oral irrigator assembly may include a control assembly with a push button at least partially surrounded by a rotating or sliding knob. The push button may be configured to engage a power button to electrically connect the motor assembly to the pump assembly. The knob may be coupled to the control valve. The oral irrigator assembly may include an oral irrigator handle fluidly coupled to the pump assembly, the pressure assembly, and the reservoir. The oral irrigator handle may be adjustably coupled to the base at the cradle.

[0006] Another embodiment of the present disclosure includes an oral irrigator assembly. The oral irrigator assembly may include a base unit and an oral irrigator handle. The base unit may include a first positioning feature. The oral irrigator handle may include a second positioning feature. The second positioning feature of the oral irrigator handle may correspond with the first positioning feature of the base unit to removably couple the oral irrigator handle to the base unit. The oral irrigator handle may be removably coupled to the base unit at any one of a plurality of desired positions relative to the base unit.

[0007] Another embodiment of the present disclosure includes a control assembly for an oral irrigator assembly. The control assembly may include a first element arranged to selectively alter a first operating state of the oral irrigator assembly. The control assembly may include a second element arranged to rotate at least partially about the first element to selectively alter a second operating state of the oral irrigator assembly.

[0008] Another embodiment of the present disclosure includes an oral irrigator assembly. The oral irrigator assembly may include a base including a pressure assembly, a fluid reservoir removably coupled to the base, an oral irrigator handle fluidly coupled to the fluid reservoir and the pressure assembly, and a control assembly including a push button at least partially surrounded by a knob. The oral irrigator handle may be adjustably coupled to the base via a magnetic attachment. The push button may be arranged to engage a power button to turn the oral irrigator assembly on and off. The knob may be coupled to the pressure assembly to adjust

at least one of a pressure and a volume of a fluid expelled through the oral irrigator handle upon movement of the knob.

[0009] 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 to limit the scope of the claimed subject matter. A more extensive presentation of features, details, utilities, and advantages of the present disclosure as defined in the claims is provided in the following written description of various embodiments of the disclosure and illustrated in the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] Fig. 1 is an isometric view of an embodiment of an oral irrigator assembly.

[0011] Fig. 2 is an isometric view of a base unit and a reservoir of the oral irrigator assembly of Fig. 1.

[0012] Fig. 3A is an isometric view of the reservoir with a lid in a first open position.

[0013] Fig. 3B is an isometric view of the reservoir with the lid in a second open position.

[0014] Fig. 3C is a cross-sectional view of the lid taken along line 3C-3C of Fig. 2.

[0015] Fig. 3D is a cross-sectional view of the lid taken along line 3D-3D of Fig. 2.

[0016] Fig. 4 is an isometric view of the base unit.

[0017] Fig. 5 is a front isometric view of a protrusion or tube nest.

[0018] Fig. 6 is a rear isometric view of the tube nest of Fig. 5.

[0019] Fig. 7 is a fragmentary cross-sectional view of an oral irrigator handle coupled to the tube nest and taken along line 7-7 of Fig. 1.

[0020] Fig. 8A is an exploded front isometric view of a control assembly.

[0021] Fig. 8B is an exploded rear isometric view of the control assembly of Fig. 8A.

[0022] Fig. 9 is a rear isometric view of a push button of the control assembly.

[0023] Fig. 10A is a rear isometric view of a rotating knob of the control assembly.

[0024] Fig. 10B is a cross-sectional view of the rotating knob taken along line 10B-10B of Fig. 10A.

[0025] Fig. 11A is a front isometric view of a bezel of the control assembly.

[0026] Fig. 11B is a rear isometric view of the bezel of Fig. 11A.

[0027] Fig. 11C is a cross-sectional view of the bezel taken along line 11C-11C of Fig. 11A.

[0028] Fig. 12 is a fragmentary, cross-sectional view of the base unit taken along line 12-12 of Fig. 4.

[0029] Fig. 13 is an isometric view of a pump assembly and a pressure assembly and a partial view of a motor assembly.

[0030] Fig. 14 is a fragmentary, cross-sectional view of the control assembly, the pressure assembly, and the motor assembly taken along line 14-14 of Fig. 4.

[0031] Fig. 15 is a fragmentary, cross-sectional view of the control assembly, the pressure assembly, and the pump assembly taken along line 15-15 of Fig. 4.

[0032] Fig. 16 is an isometric view of another embodiment of an oral irrigator assembly.

DETAILED DESCRIPTION

[0033] In some examples, an oral irrigator assembly may include a control assembly having first and second elements operable to alter first and second operating states of the oral irrigator assembly. The first and second elements may be positioned for compact operation. For example, the second element may be arranged to rotate at least partially about the first element to reduce the overall size of the control assembly compared to some traditional designs. The first element may control a first function of the oral irrigator assembly. The second element may control a second function of the oral irrigator assembly. The first element may be a push button. The second element may be a rotating or sliding knob. The push button may be selectively depressed to turn the oral irrigator assembly on and off. The oral irrigator assembly may include a control valve coupled to the knob. Selective movement of the knob may vary the volume and/or pressure of a fluid expelled through an oral irrigator handle. The first and second elements may move in first and second directions. For instance, the first element may move axially along an axis about which the second element at least partially rotates. Alternatively, the first and second elements may move axially along generally orthogonal directions.

[0034] In some examples, the oral irrigator handle may include a homing feature that assists a user in positioning the oral irrigator handle adjacent to a base unit. In one example, the homing feature of the oral irrigator handle may assist a user in positioning the handle within or adjacent a cradle extending from the base unit. The cradle may include a complementary homing feature such that the handle easily aligns to a correct position adjacent to the cradle, such as cantilevered off an end face of the cradle. In this manner, the homing features may make placement of the handle in a correct position easier for the user.

[0035] In addition to facilitating easy placement of the handle in a correct position, the homing feature(s) may also allow the base unit to include a slimmer profile compared to some traditional designs. For instance, some traditional designs include a C-clamp type structure to hold an oral irrigator handle. The homing feature(s) of the present disclosure, however, allow the traditional C-clamp holding structure to be removed from the base unit, thereby allowing the base unit to have a more compact shape. The homing feature(s) may also allow greater freedom in designing the oral irrigator handle. For example, without the need of designing the handle to fit within a C-clamp type structure, the handle may be designed with shapes that are more aesthetically appealing and/or more comfortable to, and/or easier to manipulate by, a user compared to traditional designs. In particular, the handle may be more uniform in cross-section with less taper along its length compared to traditional designs.

[0036] The homing features may be any suitable mechanism or assembly operable to quickly and easily couple the oral irrigator handle to the base unit. For example, the homing features may include complimentary magnetic materials or devices to magnetically couple the oral irrigator handle to the base unit in one or more relative positions. The magnetic materials or devices may be positioned such that magnetic attachment of the oral irrigator handle to the base unit automatically aligns the oral irrigator handle relative to the base unit. For instance, the magnetic coupling of the oral irrigator handle to the base unit may vertically align the oral irrigator handle along the base unit. Additionally or alternatively, the magnetic coupling of the oral irrigator handle to the base unit may position the oral irrigator handle at one or more predetermined or desired vertical positions relative to the base unit. For instance, the magnetic coupling of the oral irrigator handle to the base unit may position the oral irrigator handle in one of a plurality of set positions along the base unit. Alternatively, the magnetic coupling of the oral irrigator handle to the base unit may position the oral irrigator handle at any desired position along the base unit based on user preference. In such examples, the positioning of the oral irrigator handle may be restrained only by the size of the homing features themselves. For example, the homing features may define minimum and maximum spacing relative to the base unit, with the oral irrigator handle able to be positioned at any location within the minimum and maximum positions.

[0037] Fig. 1 is an isometric view of an oral irrigator assembly 100. Fig. 1 shows the oral irrigator assembly 100 with a base 102 and a reservoir 114 coupled to the base 102. The reservoir 114, which may be referred to as a fluid reservoir, may be removably or fixedly coupled to the base 102. The reservoir 114 may be coupled to the base 102 in many configurations. For example, the reservoir 114 may be positioned at least partially on top of the

base 102. As shown in Fig. 1, a toothbrush 104 and an oral irrigator handle 106 may be releasably coupled to the base 102. For instance, at least one of the toothbrush 104 and the oral irrigator handle 106 may rest on the base 102, may be secured to a vertical face or wall of the base 102, or the like, or any combination thereof. The oral irrigator handle 106 may be coupled to a tube 108 that is stored around a tube nest 110. The tube nest 110 may be coupled to the base 102. The base 102, which may be referred to as a base unit, may also have a control assembly 112. The reservoir 114 may have a lid 116. In some examples, the toothbrush 104 is removable from the base 102. The oral irrigator handle 106 may be removably coupled to the base 102 at the tube nest 110, and fluidly connected to the reservoir 114 through the tube 108. The oral irrigator handle 106 may be connected to a jet tip 107 (shown in Fig. 16). As explained below, the oral irrigator handle 106 may be adjustably coupled the base 102.

[0038] Fig. 2 is an isometric view of the oral irrigator assembly 100 of Fig. 1, with the toothbrush 104, oral irrigator handle 106, and tube 108 removed for illustration purposes. As shown in Fig. 2, the tube nest 110 may include a cradle 118 configured to hold the oral irrigator handle 106. In some examples, the cradle 118 may include a shape complementary to that of the oral irrigator handle 106 for complementary engagement therewith. For instance, the cradle 118 may be curved to complement or generally complement an outer profile shape of the oral irrigator handle 106. In some examples, the base 102 may have a tube routing aperture 122 formed in an extension 103 of the base 102. The extension 103 may be generally rectangular shaped and may horizontally extend away from a lower portion of the main body of the base 102. In such examples, the extension 103 may define a shelf on which the toothbrush 104 and/or oral irrigator handle 106 may be stored.

[0039] Fig. 16 is an isometric view of another embodiment of an oral irrigator assembly 1600. Unless otherwise noted, the oral irrigator assembly 1600 of Fig. 16 is configured similarly to the oral irrigator assembly 100 described herein. For instance, with reference to Fig. 16, the oral irrigator assembly 1600 may differ from the oral irrigator assembly 100 of Figs. 1 and 2 in that the oral irrigator assembly 1600 of Fig. 16 does not include toothbrush 104. In all or substantially all other aspects, however, the oral irrigator assembly 1600 may be similar to oral irrigator assembly 100.

[0040] Figs. 3A and 3B show a reservoir assembly 126 with the lid 116 in different open positions. Fig. 3A is an isometric view of the reservoir 114 with the lid 116 in a first open position. Fig. 3B is an isometric view of the reservoir 114 with a lid 116 in a second open position. Figs. 3C and 3D are cross-sectional views of a hinge structure of the lid 116.

Referring to Figs. 3A-3D, the lid 116 may have an adjustable portion 128 that may rotate with respect to a fixed portion 130 about hinges 134 that pivotally couple the adjustable portion 128 and the fixed portion 130 together. Both the adjustable portion 128 and the fixed portion 130 may have vents 132. In some examples, the fixed portion 130 may be adjustably secured to the reservoir 114, while the adjustable portion 128 may couple with the reservoir 114 when the adjustable portion 128 is in a closed position, as shown in Figs. 1 and 2.

[0041] Referring to Figs. 3C and 3D, the hinges 134 may be defined as first and second links 127, 129 connected together. Depending on the particular application, the first and second links 127, 129 may be formed integrally as a single element, or may be separate elements connected together, either fixedly or otherwise. The first link 127 may be attached to the adjustable portion 128 of the lid 116. As shown in Figs. 3C and 3D, the second link 129 may extend from a distal end 131 of the first link 127. The second link 129 may extend at an angle to the first link 127. The angle between the first and second links 127, 129 may be an acute angle, a 90° angle, or an obtuse angle to allow the adjustable portion 128 to pivot relative to the fixed portion 130. The angle between the first and second links 127, 129 may also define a fully opened position of the adjustable portion 128. For instance, the adjustable portion 128 may be moved away from the reservoir 114 until the second link 129 of the hinge 134 contacts a portion of the fixed portion 130 to define a fully opened position of the lid 116. In such examples, a larger angle between the first and second links 127, 129 may allow the adjustable portion 128 to move further away from the reservoir 114. In like manner, a smaller angle between the first and second links 127, 129 may limit the amount of rotation of the adjustable portion 128 away from the reservoir 114.

[0042] With continued reference to Figs. 3C and 3D, a pivot assembly 133 may be coupled to the fixed portion 130 to which the second link 129 is rotatably coupled. For example, a distal end 135 of the second link 129 may define a clip structure 141 sized and shaped to surround a majority of a pivot shaft 143 of the pivot assembly 133. In one example, the clip structure 141 may include opposing sections or fingers 145 defining a crescent shape to at least partially surround the pivot shaft 143, though other suitable configurations are contemplated. The hinge 134 may rotate about the pivot shaft 143 to move the adjustable portion 128 between open and closed positions.

[0043] In some examples, the lid 116 may include structure operable releasably hold the adjustable portion 128 in an open position. For example, as shown in Fig. 3D, a tab 146 may extend from the first link 127 and/or the second link 129 of the hinge 134. A distal end 148 of the tab 146 may be curved or angled to define a seat 150. With continued reference to Fig. 3D,

a post 152 may extend from the fixed portion 130. As the adjustable portion 128 moves relative to the fixed portion 130, the tab 146 may move relative to the post 152 until the post 152 engages the seat 150 at which point further movement of the tab 146 relative to the post 152 may be limited (see Fig. 3B). In this position, the adjustable portion 128 of the lid 116 may be releasably held in place to allow easy filling of the reservoir 114.

[0044] The reservoir 114 may be formed with two opposing generally planar sides 136, 138 that are generally normal to a generally planar front face 140 that opposes a generally planar rear face 142. In some examples, the sides 136, 138 have a width that is smaller than a width of each of the front face 140 and the rear face 142. A bottom 137 of the reservoir 114 may be configured with a sealable port 139 to couple to a valve assembly 144 to fluidly connect the reservoir 114 with a pressure assembly and a pump assembly in the base 102, as described more fully below.

[0045] Figs. 4-6 show the base 102 and various components of the oral irrigator assembly 100. Fig. 4 is an isometric view of an oral irrigator base 102. The base 102 may have an outer housing or shell 200 that houses a portion of the control assembly 112, a motor assembly 504, a pressure assembly 502, and a pump assembly 500. The base 102 may have a charging post 120 configured to provide an electric charge to the toothbrush 104 to maintain or recharge the battery power of the toothbrush 104 when it is coupled to the base 102. The charging post 120 may be formed using a portion of the outer housing 200 covering the extension 103 of the base 102 and various electrical components stored within the outer housing 200.

[0046] Figs. 5 and 6 are front and rear isometric views of the tube nest 110. As shown, a portion of the tube nest 110 may extend away from a front face 202 of the base 102 to form a protrusion 222. The protrusion 222 may be generally cylindrically shaped with a taper from a larger diameter at its rear 226 located proximal to the front face 220 towards its front 228. In some examples, the protrusion 222 and the front face 220 may be separate components connected together or they may be molded together as a single piece. The interface between the protrusion 222 and the front face 220 may form a tube recess 124. The tube recess 124 may be formed such that it extends rearward of the front face 220 in a direction opposite that of the tube nest 110. The tube recess 124 may have a width that is larger than a diameter of the tube 108 shown in Fig. 1. This may allow for the tube 108 to be wrapped about the protrusion 222 and seat within the tube recess 124.

[0047] The tube nest 110 may also have a channel 230 formed in a lower portion thereof, the tube nest 110 extending downward from the tube recess 124. The channel 230 may have a

width and depth that is larger than the diameter of the tube 108 shown in Fig. 1, as to allow the tube 108 to sit within the channel 230.

[0048] A portion of the front 228 of the protrusion 222 may be formed as the cradle 118. The cradle 118 may have a concave shape that curves away from the front 228 and towards the rear 226 of the protrusion 222. In some examples, the cradle 118 may be formed with attachment or securing devices to help position or temporarily secure the oral irrigator handle 106 so that it is adjacent the cradle 118 when stored by a user. In some examples, the cradle 118 may be formed from a magnetic material to help secure or position the oral irrigator handle 106. In some examples, the oral irrigator handle 106 has a complementary attachment, securing, or homing device to releasably position or secure the oral irrigator handle 106 at least partially within or adjacent to the cradle 118.

[0049] With reference to Fig 6, the protrusion 222 may form a hollow interior cavity 232 defined by an interior face 234 and sidewall 236. In some examples, interior ribs 238 may extend from the interior face 234 and sidewall 236 of the protrusion 222. As shown, the ribs 238 may extend radially inward from the sidewall 236, though other suitable configurations are contemplated. In some examples, the base 102 (e.g., the protrusion 222) may include a first positioning feature. For example, a magnetic coupling device, such as a first magnet device 240 or magnetic material, may be positioned within the interior cavity 232 of the protrusion 222. For example, the first magnet device 240 may be defined or positioned on the interior face 234 and/or the ribs 238. In some examples, the first magnet device 240 may be held in place by the ribs 238 or positioned between the ribs 238. In some examples, the ribs 238 may also be formed from a magnetic material. In some cases, a stronger magnetic material may be coupled to or positioned adjacent to the interior face 234 while a weaker magnetic material may be used to form the ribs 238. This may help the cradle 118 to act as a homing device for the complementary attachment or securing device of the oral irrigator handle 106.

[0050] Fig. 7 is a fragmentary cross-sectional view showing the oral irrigator handle 106 coupled to the protrusion 222. Referring to Fig. 7, the oral irrigator handle 106 may include a second positioning feature corresponding with the first positioning feature of the base 102 to removably couple the oral irrigator handle 106 to the base 102. As explained below, the first and second positioning features may allow the oral irrigator handle 106 to be removably coupled to the base 102 at any one of a plurality of desired positions relative to the base 102. As shown in Fig. 7, the second positioning feature may be a second magnet device 242. The second magnet device 242 may be defined or positioned on or within the oral irrigator handle 106. For example, at least a portion of the oral irrigator handle 106 may be formed from a magnetic

material to magnetically couple the oral irrigator handle 106 to the cradle 118. In such examples, the second magnet device 242 of the oral irrigator handle 106 may be magnetically attracted to the first magnet device 240 of the base 102 to magnetically couple the oral irrigator handle 106 to the base 102. For instance, the magnetic attraction between the first and second magnet devices 240, 242 may magnetically couple the oral irrigator handle 106 to the cradle 118 when the oral irrigator handle 106 is positioned near the protrusion 222. In this manner, the first and second magnet devices 240, 242 may automatically align the oral irrigator handle 106 into a correct storage position. In this way, the first and second magnet devices 240, 242 may act as homing features that assist a user in positioning the oral irrigator handle 106 adjacent to the base 102.

[0051] The first and second magnet devices 240, 242 may be arranged to removably couple the oral irrigator handle 106 to the base 102 at any one of a plurality of desired positions relative to the base 102. In particular, the first and second magnet device 240, 242 may removably couple the oral irrigator handle 106 to the base 102 at any one of a plurality of vertically adjacent positions relative to the base 102. For instance, the first and second magnet devices 240, 242 may be arranged to position the oral irrigator handle 106 at a desired spacing above the extension 103 of the base 102. This may allow a user to couple the oral irrigator handle 106 to the base 102 at a desired vertical position based on user preference. For instance, the protrusion 222 may be coupled to the oral irrigator handle 106 at any position along the length of the oral irrigator handle 106 to allow user positioning of the oral irrigator handle 106 nearer or further away from the extension 103 as desired. In this manner, a user may position the oral irrigator handle 106 nearer the extension 103 to reduce a height of the oral irrigator assembly 100, which may allow the oral irrigator assembly 100 to be positioned or stored in smaller spaces compared to traditional designs, such as underneath a shelf or within a cabinet, among others.

[0052] In some examples, the magnetic composition of the interior face 234 and/or the ribs 238 may allow for the oral irrigator handle 106 to be magnetically attracted to the cradle 118 when the oral irrigator handle 106 is positioned near the cradle 118. For example, the oral irrigator handle 106 may include a complimentary or corresponding magnetic coupling device, such as a magnet or a magnetic material, that magnetically couples the oral irrigator handle 106 to the cradle 118. In some examples, the stronger pull of the interior face 234 may assist the user in properly positioning the oral irrigator handle 106 within or adjacent to the cradle 118. In some examples, the complementary attachment or securing devise of the oral irrigator handle 106 may be positioned so that the oral irrigator handle 106 may always be stored in a set

position or a plurality of positions. This may allow the user easier access as the oral irrigator handle 106 is generally stored in the correct position that allows for the user to easily grasp the handle and remove it from the cradle 118.

[0053] Figs. 8A-12 show various views of a user interface or control assembly 112 and its components. Figs. 8A and 8B are exploded front and rear isometric views of the control assembly 112. Figs. 8A and 8B show a push button 302, a knurled knob 304, a rotating or sliding knob 306, a coupling link 308, a bezel 310, a button 312, a switch 314, a control valve 318, and a valve face plate 316. The control valve 318 may be configured similarly to the valve structure disclosed in U.S. Patent Application Publication No. 2011/0097683 . The general features of the various components illustrated in Figs. 8A and 8B will now be described.

[0054] Fig. 9 is a rear isometric view of the push button 302, which may be referred to as a power button. Fig. 9 shows the push button 302 with a front face 324 and a rear face 330 opposing the front face 324. The front face 324 and the rear face 330 may be generally planar. The front face 324 and the rear face 330 may be generally circular in shape and separated by a perimeter wall 332. The perimeter wall 332 may be generally normal to both the front face 324 and the rear face 330 and form an outer perimeter or circumference of the push button 302.

[0055] A first leg 320 and a second leg 322 may extend from the rear face 330 away from the front face 324 of the push button 302. The first and second legs 320, 322 may each have a tab 334 on an end thereof that is distal the rear face 330. Each tab 334 may extend away from its associated leg 320 or 322. For instance, the tabs 334 may extend in a direction perpendicular to the first and second legs 320, 322 and away from a central axis 380. For example, depending on the particular application, the tabs 334 may extend away from each other, in a direction radially away from the central axis 380, or the like. The first and second legs 320, 322 may be shaped similar to, or different from, each other. For instance, the first leg 320 may be longer than the second leg 322, or vice-versa. Each tab 334 may act as a detent to position the push button 302 within the control assembly 112.

[0056] A cylindrically shaped bias element 326 and cylindrically shaped central core 328 may also extend from the rear face 330 away from the front face 324. The central core 328 may have a diameter that is smaller than the diameter of the bias element 326. The central core 328 may be a hollow cylinder centered about the central axis 380. The central core 328 may have a first end 344 adjacent the rear face 330, and a second end 346 opposite the first end 344, and an outside surface 348 and an inside surface 350. The second end 346 may also be beveled on an inner edge.

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[0057] The bias element 326 may have a diameter that is smaller than a diameter of the front face 324 and the rear face 330. The bias element 326 is cylindrically shaped with an upper arc portion 335 located above the first and second legs 320, 322 and a lower arc portion 336 located below the first and second legs 320, 322. The upper arc portion 335 may have a stabilizer 342 adjacent the rear face 330 and extending away from the front face 324. The stabilizer 342 may be formed from a plurality of ribs and protrusions extending away from the rear face 330. A connector 340 extends from the stabilizer 342 to connect the stabilizer 342 to the middle of a flexible arcuate finger 338. The connector 340 may be single protrusion or extrusion. The flexible finger 338 may be a portion of a cylinder with a resting diameter that is configured to flex radially outward to a larger diameter when the flexible finger 338 contacts a seat of the knob 306, as explained below. The flexible finger 338 may be formed with two arcuate band-shaped portions connected to each other at their respective ends. The lower arc portion 336 may be similarly shaped and function similarly to the upper arc portion 335. For example, the lower arc portion 336 may include a stabilizer 343 connected to a flexible finger 339 by a connector 341 in a manner similar to that described above. Though the bias element 326 is shown and described as a molded in biasing structure, in some examples, the bias element 326 may be a spring coupled to the push button 302. For instance, depending on the particular application, the bias element 326 may be a metal spring extending around the central core 328, such as annularly spaced from the central core 328.

[0058] Fig. 10A is a rear isometric view of the knob 306. Fig. 10B is a cross-sectional view along line 10B-10B of Fig. 10A. The knob 306 may have an outer ring 360 that is connected to a central core 366 by both a web 368 and seat 384. The outer ring 360 may be cylindrically shaped about the central axis 380, with an outside perimeter formed by a knurled knob mounting surface 362 and an abutting wall 364. The knurled knob mounting surface 362 may have a diameter smaller than the diameter of the abutting wall 364. The knurled knob mounting surface 362 may have ribs 382 extending therefrom. In one example, the ribs 382 may extend away from the central axis 380, such as radially away from the central axis 380. The outer ring 360 may have a leading edge 363 at the end of the knurled knob mounting surface 362 opposite the end adjacent to the abutting wall 364.

[0059] The outer ring 360 may be connected to the central core 366 through the web 368 and seat 384. The web 368 and the seat 384 may be somewhat orthogonal to the outer ring 360. The seat 384 may be shaped as an annular ring, with a proximal mating face 386 and a distal mating face 388 opposite the proximal mating face 386. The seat 384 may be convexly shaped, and shallowly curve away from the center of the oral irrigator assembly 100. In some

examples, the proximal mating face 386 may form an angle that is less than 90 degrees with the abutting wall 364. The seat 384 may connect to the abutting wall 364 of the outer ring 360 at a step 390. An inner portion of the seat 384 may connect with the web 368.

[0060] In some examples, the web 368 may connect the seat 384 to an outer surface 376 of the central core 366. In some examples, the web 368 may be a plurality of spokes, each with an inner edge 392 adjacent to the central core 366 and an outer edge 394 adjacent to the seat 384. The spokes may taper in width from the seat 384 to the central core 366. For example, the inner edge 392 may have a length that is shorter than the length of the outer edge 394. Similar to the seat 384, the web 368 may also be convexly shaped, and shallowly curve away from the center of the oral irrigator assembly 100. In the example of Fig. 10A, two arcuate spaces 385 may be formed between the seat 384, the web 368, and the central core 366.

[0061] The central core 366 may be cylindrically shaped, with the outer surface 376 and an interior surface 378. The central core may have a front edge 372 that is proximal to the leading edge 363 of the outer ring 360, and a rear edge 374 opposite that of the front edge 372. In some examples, an annular seat 398 is formed in the outer surface 376 near the rear edge 374. The annular seat 398 may be formed as a recessed area that encompasses the circumference of the central core 366.

[0062] A plurality of alignment tabs 370 may extend inward from the interior surface 378 towards the central axis 380. In some examples, the alignment tabs 370 are spaced apart in pairs about a circumference of the interior surface 378, such that a spacing between a first tab and a second tab is equal to the spacing between a third tab and a fourth tab, but the spacing between the first and the third tabs and the second and fourth tabs is larger than between the first and second tabs. The paired tabs 370 may be used to align the coupling link 308 within the control assembly 112, as further described herein.

[0063] Figs. 11A-11C are various views of the bezel 310. Fig. 11A is a front isometric view of the bezel 310, Fig. 11B is a rear isometric view of the bezel 310, and Fig. 11C is a cross-sectional view along line 11C-11C of Fig. 11A. Referring to Figs. 11A-11C, the shape of the bezel 310 may be formed at least partially by two concentric cylinders or walls. For example, an outer wall 410 may form a larger, outer cylinder, and two curved support walls 418 and two connecting nubs 416 may together form a smaller, inner cylinder. A knob mating wall 408 may connect the outer wall 410 to the curved support walls 418 and connecting nubs 416. A perimeter wall 404 extends as a flange about the outer wall 410.

[0064] The outer portion of the bezel 310 may be formed by the perimeter wall 404. As shown, the perimeter wall 404 may include a base mating face 400 and a rear face 402

opposite the base mating face 400. The cross-sectional view of Fig. 11C shows that the perimeter wall 404 may have a generally concave shape that curves away from the center of the oral irrigator assembly 100. The curved shape of the perimeter wall 404 may mimic the shape of an internal wall of the base 102 adjacent to which the bezel 310 may be positioned.

[0065] The outer perimeter of the perimeter wall 404 may be generally annularly shaped except near a top portion that increases in diameter to form a tab 405 with an alignment slot 406. The alignment slot 406 may be formed in the upper portion of the perimeter wall 404, proximal to the reservoir 114 of the oral irrigator assembly 100. The alignment slot 406 may be used to align the rotational position of the bezel 310 with respect to the base 102.

[0066] The outer wall 410 may extend orthogonally from the base mating face 400 of the perimeter wall 404 and away from the rear face 402. The outer wall 410 may connect the knob mating wall 408 to the perimeter wall 404. At the intersection of the outer wall 410 and the knob mating wall 408, a lip 420 may be formed.

[0067] The knob mating wall 408 may be generally orthogonal to the outer wall 410. The knob mating wall 408 may have a proximal face 412 and a distal face 414. The knob mating wall 408 may be annularly shaped, with an outer perimeter formed at the outer wall 410 and an inner perimeter formed by the curved support walls 418 and the connecting nubs 416. The knob mating wall 408 may be curved with an angle that mirrors the angle of the web 368 and seat 384 of the knob 306.

[0068] A plurality of leg receiving ports 422 may be formed within the knob mating wall 408 and include an aperture that extends between the proximal face 412 and the distal face 414. The leg receiving ports 422 may also extend orthogonally from the proximal face 412 and away from the distal face 414. In some examples, the leg receiving ports 422 may have a cross-sectional shape that is generally rectangular, similar to the shape shown in Fig. 11A. In other examples, the cross-sectional shape may be round, triangular, oblong or other similar shapes.

[0069] In some examples, the leg receiving ports 422 may have an inner edge proximal to a central bore 424 formed by the curved support walls 418 and connecting nubs 416. The inner edge of the leg receiving ports 422 may curve outward from the central bore 424, similar to the shape of the curved support walls 418. In some examples, the leg receiving ports 422 are spaced equally about the central bore 424.

[0070] The central bore 424 may be formed through the proximal face 412 and the distal face 414 of the knob mating wall 408. The curved support walls 418 and connecting nubs 416 may extend orthogonally from the distal face 414 and away from the proximal face 412. The curved support walls 418 may have a generally constant thickness and may be curved about

the central axis 380. The connecting nubs 416 may taper in thickness from a larger width adjacent the distal face 414 to a smaller width with distance away from the distal face 414. At opposite distal edge of the connecting nubs 416, a detent 426 may be formed. The detent 426 may be a raised feature that extends inwardly from the connecting nub 416 and towards the central axis 380.

[0071] With reference to Fig. 8A and 8B, the coupling link 308 may have a cylindrical center portion 309 positioned between two bulbous ends 311. In some examples, the bulbous ends 311 may be spherically shaped. Each bulbous end 311 may have two fingers 313 that protrude from opposite sides. The fingers 313 may be cylindrically shaped to couple with the control valve 318 and the knob 306.

[0072] Figs. 13-15 show various views of the control assembly 112, a pressure assembly 502, a pump assembly 500, and a motor assembly 504. Fig. 13 is an isometric view of the pump assembly 500, the pressure assembly 502 and a partial view of the motor assembly 504. Fig. 14 is a cross-sectional isometric view of the control assembly 112, the pressure assembly 502, and the motor assembly 504 along line 14-14 of Fig. 4. Fig. 15 is a cross-sectional isometric view of the control assembly 112, pressure assembly 502, the pump assembly 500, and the motor assembly 504 along line 15-15 of Fig. 4.

[0073] The various components of the pressure assembly 502 will now be described. As shown in Fig. 15, the pressure assembly 502 may be fluidly connected to the reservoir valve actuator 524. The reservoir valve actuator 524 may be configured to allow fluid stored within the reservoir 114 to flow through a channel in the reservoir valve actuator 524 and into a pressure assembly housing 506 of the pressure assembly 502. The top portion of the reservoir valve actuator 524 may have engagement points that contact the valve assembly 144, and help compress a spring in the valve assembly 144. The compression of the spring with the valve assembly 144 allows the valve assembly 144 to disengage from the sealable port 139. Once the valve assembly 144 is disengaged from the sealable port 139, fluid may flow from the reservoir 114, around the valve assembly 144, through the sealable port 139, through the reservoir valve actuator 524, and into the pressure assembly 502

[0074] The pressure assembly 502 is located downstream of the reservoir valve actuator 524, and may have a pressure valve inlet 526 located upstream of a pressure valve 528, and a pressure valve outlet 530 located downstream of the pressure valve 528. The pressure valve 528 is configured with a spring that allows the pressure valve 528 to move up and down (towards and away from the reservoir 114) within the pressure assembly housing 506 when a vacuum is applied to the pressure valve 528.

[0075] The pressure assembly housing 506 may be fluidly connected to the control valve 318. The pressure assembly housing 506 may have a diverter inlet 532 located downstream of the pressure valve 528 and a diverter outlet located upstream of the pressure valve 528 but downstream of the pressure valve inlet 526. A portion of the control valve 318 may be rotatably positioned within the pressure assembly housing 506 and positioned adjacent the valve face plate 316. The rotatable position of the control valve 318 with respect to the valve face plate 316 allows a fluid pathway to be selectively formed between the diverter inlet 532 and the diverter outlet 534. The pressure assembly 502 may be fluidly connected to the pump assembly 500.

[0076] As shown in Figs. 13 and 15, the pump assembly 500 may have a pump housing 508 that encapsulates a pump inlet 536, a cylinder 542, a portion of a connecting rod 510, a piston 540, and a pump outlet 538. In some examples, the pump inlet 536 is adjacent and fluidly connected to the pressure valve outlet 530. The cylinder 542 may enclose a piston 540. The piston 540 may be connected to a first end of a connecting rod 510. In some examples, the piston 540 is cylindrically shaped and similar to a cylindrical shape of the cylinder 542. The attachment of the piston 540 to the connecting rod 510 may allow the piston to be moved laterally within the cylinder 542, and be pushed towards the control assembly 112 and away from the control assembly 112, based on the position of the first end of the connecting rod 510. The cylinder 542 fluidly connects the pump inlet 536 with the pump outlet 538. There may be a clearance fit between the piston 540 and the cylinder 542 that is a relatively small distance, such that fluid present within the pump assembly 500 may not flow past the piston 540 within the cylinder 542. The pump assembly 500 may be coupled to the motor assembly 504.

[0077] The motor assembly 504 is shown in Figs. 13-15. As shown in Fig. 14, the motor assembly 504 may have a motor 522 with a drive shaft 520 extending from a bottom portion of the motor 522. The drive shaft 520 may be positioned within and coupled to a driver gear 518. The driver gear 518 may have a plurality of teeth with a pitch length and an angled, beveled, or helical shape. The driver gear 518 may be coupled to a driven gear 516. The driven gear 516 may have a plurality of teeth with the same pitch length and tooth shape as the driver gear 518. In some examples, a diameter of the driver gear 518 may be smaller than that of the driven gear 516. In some other examples, a belt drive couples the driver gear 518 and driven gear 516.

[0078] As shown in Fig. 13, the driven gear 516 may have a central section that extends upwards towards the reservoir 114. The central section may be formed with an eccentric lobe 512. The eccentric lobe 512 may be a cylinder that extends away from the driven gear 516, with a central axis that is offset from the driven shaft 514. An interior portion of the eccentric lobe

512 may be formed to couple with a driven shaft 514. An exterior portion of the eccentric lobe 512 may be configured to couple with a second end of the connecting rod 510.

[0079] With continued reference to Figs. 13-15, the overall assembly of the oral irrigator assembly 100 will now be described. As shown in Figs. 13-15, the motor 522 may be positioned so that the drive shaft 520 is inserted within or coupled to the motor 522. An opposing end of the drive shaft 520 may be coupled to the driver gear 518. The driven gear 516 may be positioned adjacent the driver gear 518 so that the teeth of the driver gear 518 mesh with the teeth of the driven gear 516. The second end of the connecting rod 510 may be positioned about the eccentric lobe 512 extending from the driven gear 516. The first end of the connecting rod 510 may be coupled to the piston 540, and the piston 540 positioned may be within the cylinder 542 of the pump assembly 500.

[0080] As shown in Fig. 15, the pressure valve 528 may be positioned within the pressure assembly housing 506 of the pressure assembly 502. The pressure assembly 502 may be coupled to the pump assembly 500 so that the pressure valve outlet 530 is fluidly coupled with the pump inlet 536.

[0081] The control valve 318 may be positioned adjacent to and between the diverter inlet 532 and the diverter outlet 534 of the pressure assembly housing 506. The valve face plate 316 may be positioned adjacent to the pressure assembly housing 506 that surrounds a portion of the control valve 318. The coupling link 308 may be positioned within an extending cylinder portion of the control valve 318.

[0082] As shown in Figs. 12 and 14, the push button 302 may be coupled with the knob 306 and the bezel 310. The base mating face 400 of the bezel 310 may be positioned adjacent to an interior surface of the base 102. The alignment slot 406 may be aligned with a post formed on the interior surface of the base 102. The proximal face 412 of the knob mating wall 408 of the bezel 310 may be positioned adjacent to the distal mating face 388 of the knob 306. The detents 426 of the connecting nubs 416 of the bezel 310 may align with the annular seat 398 of the knob 306, helping fix a lateral position of the bezel 310 and knob 306 with respect to each other, but still allowing the knob 306 to rotate about the bezel 310. The lip 420 of the bezel 310 may be positioned adjacent to the step 390 of the knob 306.

[0083] The push button 302 may then be assembled to the knob 306 and the bezel 310. The push button 302 may be aligned so that the first leg 320 is positioned to a front of the oral irrigator assembly 100 and the second leg 322 is positioned to a rear of the oral irrigator assembly 100. The first leg 320 and second leg 322 may be inserted into the respective one of the arcuate openings of the spaces 385 created between the web 368, the seat 384, and the

central core 366 of the knob 306 and then through the leg receiving ports 422 of the bezel 310. The tabs 334 present on the end of each leg 320, 322 may help prevent the push button 302 from being separated from the knob 306 and bezel 310, as the tabs 334 may engage with the distal face 414 of the knob mating wall 408 of the bezel 310.

[0084] The knurled knob 304 may be coupled to the knob 306 about the knurled knob mounting surface 362. The knurled knob 304 may be adjustably fixed to the knob 306 by a press fit formed by the interaction of the ribs 382 extending away from the knurled knob mounting surface 362 and contacting the inside surface of the knurled knob 304.

[0085] The coupling link 308 may be positioned between the knob 306 and the control valve 318. The fingers 313 on one of the bulbous ends 311 align with the tabs 370 of the knob 306. The fingers 313 on the opposite bulbous end 311 may then align with two notches in the control valve 318. The alignment of the legs with the knob 306 and the control valve 318 effectively couples the knob 306 with the control valve 318. When a user rotates the knob 306, the control valve 318 is also rotated in the same direction and the same rotational distance.

[0086] The position of the push button 302 within the bezel 310 may align the first leg 320 of the push button 302 with the button 312. The button 312 may be physically coupled with the switch 314, and the switch 314 is then physically coupled to the valve face plate 316. The switch 314 may then be electrically coupled to the motor 522. The motor assembly 504, the pump assembly 500 and the pressure assembly 502 may then be positioned within the base 102, with the control assembly 112 being positioned mounted on an exterior of the base 102.

[0087] The tube 108 may be connected to the oral irrigator handle 106. The tube 108 may then be wrapped around the tube nest 110 when the oral irrigator handle 106 is in a stored position. In some examples, the tube recess 124 formed by the tube nest 110 and the base 102 may allow for a portion of the tube 108 wrapped around the tube nest 110 to be contained within the tube recess 124. Additionally or alternatively, the tube routing aperture 122 may allow for a portion of the tube 108 adjacent the oral irrigator handle 106 to hang below the oral irrigator handle 106 and not contact the base 102. For example, when the oral irrigator handle 106 is coupled to the base 102 at the tube nest 110, a portion of the tube 108 adjacent to the oral irrigator handle 106 may be received within the tube routing aperture 122 to allow proper alignment of the oral irrigator handle 106 within the cradle 118 without structural interference between the tube 108 and the base 102.

[0088] Operation of the oral irrigator assembly 100 will now be described. To begin, the user may remove the reservoir 114 from the assembly 100, and open the adjustable lid 116 to fill the reservoir 114 with fluid. The user may then close the adjustable lid 116 and couple the

reservoir 114 to the oral irrigator assembly 100. The reservoir valve actuator 524 may engage the valve assembly 144 of the reservoir 114 to allow fluid stored within the reservoir 114 to flow into and through the pressure assembly 502, into and through the pump assembly 500, and through the tube 108 into the oral irrigator handle 106.

[0089] A user may engage the control assembly 112 to turn the oral irrigator assembly 100off and on, and to also adjust the pressure and/or volume of fluid that may be supplied to the oral irrigator handle 106 and eventually released from the oral irrigator handle 106 through the jet tip 107. To turn the oral irrigator assembly 100 on and off, a user may contact the front face 324 of the push button 302 to force or depress the push button 302 towards the base 102 of the oral irrigator assembly 100. The push button 302 may be moved with respect to the control assembly 112 when the user exerts a force on the push button 302 that is greater than the bias force provided by the bias element 326.

[0090] The flexible fingers 338, 339 may be configured to flex to a larger diameter when the fingers 338, 339 contact the seat 384 of the knob 306. For instance, the sloped shape of the seat 384 may force the fingers 338, 339 apart to allow the push button 302 to be moved horizontally axially inward with respect to the knob 306.

[0091] The movement of the push button 302 may then allow the first leg 320 to contact the button 312, which may then activate the switch 314 to selectively turn on or off the oral irrigator assembly 100. The biased design of the push button 302 allows it to return to its resting position with respect to the control assembly 112 when the user releases contact on the push button 302. When the push button 302 is engaged, an electrical connection is made through the switch 314, which connects an electrical circuit to activate the motor 522. The motor 522 begins to rotate, which rotates the drive shaft 520. The rotation of the drive shaft 520 rotates the driver gear 518, which in turn rotates the driven gear 516. The ratio of the diameters of the driver gear 518 and the driven gear 516 determines the rotational speed change from the driver gear 518 to the driven gear 516. The rotation of the driven gear 516 causes the eccentric lobe 512 to eccentrically rotate about the driven shaft 514, which moves the connecting rod 510 eccentrically laterally back and forth, towards and away from the control assembly 112.

[0092] The lateral movement of the connecting rod 510 moves the piston 540 in the same lateral movement back and forth within the cylinder 542. This piston 540 movement causes an alternating vacuum or negative pressure and a positive pressure. The negative pressure is enough to move the pressure valve 528 within the pressure assembly housing 506 downward to allow fluid to flow through the pressure valve 528 and the pressure valve outlet 530. The

positive pressure moves the pressure valve 528 to position the pressure valve 528 so that fluid may not flow in through the pressure valve 528 and through the pressure valve outlet 530. The piston 540 movement allows for a pulsed flow to be supplied through the tube 108 and into the oral irrigator handle 106.

[0093] The rotation of the knob 306 may control the pressure and/or volumetric flow of a fluid out of the oral irrigator handle 106. In some examples, the leg receiving ports 422 of the bezel 310 may provide a limit as to the rotation in one direction or an opposite direction of the knob 306 about the bezel 310. A user may rotate the knurled knob 304 to rotate the knob 306 about the bezel 310. The knob 306 may be rotated in a clockwise direction until the web 368 of the knob 306 contacts the leg receiving port 422 of the bezel 310 that is surrounding the first leg 320. Similarly, the knob 306 may be rotated in a counter clockwise direction until the web 368 contacts the leg receiving port 422 surrounding the second leg 322.

[0094] When the knob 306 is rotated in a first direction, the rotation of the knob 306 causes the rotation of the coupling link 308, which causes the rotation of the control valve 318. The rotation of the control valve 318 may cause a fluid pathway to be formed between the control valve 318 and the valve face plate 316 to fluidly connect the diverter inlet 532 with the diverter outlet 534. The creation of this fluid pathway may allow for a volume of fluid flowing from the reservoir 114 and through the pressure assembly 502 to be siphoned away from the pressure valve outlet 530, through the control valve 318, and back through the pressure valve 528. The size of the fluid pathway may be dependent on the position of the control valve 318 adjacent the valve face plate 316. A large fluid pathway may result in a decreased volume and pressure of the fluid that exits the pressure valve outlet 530 and is eventually transmitted through the oral irrigator handle 106. A small fluid pathway may divert a smaller volume of water away from the pressure valve outlet 530, such that the volume and pressure of the fluid that exits the pressure valve outlet 530 is not substantially decreased.

[0095] With reference to Figs. 1, 2, and 16, the shape of the cradle 118 may help position or temporarily couple the oral irrigator handle 106 within or adjacent to the cradle 118. In some examples, there is not a set position for the oral irrigator handle 106 to couple with the cradle 118. As noted above, the protrusion 222 from which the cradle 118 is formed may have magnetic material to align with magnetic material or feature within the oral irrigator handle 106. In some examples, the location of the magnetic material helps position the oral irrigator handle 106 in a first position. In other examples, there may be a plurality of positions in which the magnetic material of the protrusion 222 may align with a magnetic feature in the oral irrigator handle 106. In such examples, the vertical position of the oral irrigator handle 106 with respect

to the cradle 118 may be adjusted based upon user preference. For instance, the user may position the oral irrigator handle 106 at a desired spacing of the oral irrigator handle 106 above the extension 103 based upon user preference.

[0096] In some examples, the oral irrigator handle 106 may be adjusted to a vertical positon that positions the portion of the tube 108 adjacent the oral irrigator handle 106 within the tube routing aperture 122. The temporary location of the portion of the tube 108 adjacent the oral irrigator handle 106 may allow for the oral irrigator handle 106 to be moved to a vertical position that is lower with respect to the base 102 than with a base without a tube routing aperture 122. This ability to adjust the vertical location of the oral irrigator handle 106 with respect to the base 102 may also allow for a user to more easily access the reservoir 114 to remove the reservoir 114 from the base 102 to refill it with a fluid in preparation for use.

[0097] In some examples, the shape of the reservoir 114 may better help a user to grasp the reservoir 114 with one hand. For example, the reservoir 114 may have a narrow width that may be more amenable to a user grasping with one hand, as opposed to a bulky reservoir which would require a user to use both hands to grasp the reservoir. A user may grasp the reservoir 114 with one hand when removing the reservoir 114 for refilling or when assembling the reservoir 114 back with the oral irrigator assembly 100 in preparation for use or storage. To grasp the reservoir, the user may place his or her fingers on the planar face 140 or 142 and his or her thumb on the opposite planar face 140 or 142 and apply inward pressure.

[0098] In some examples, the location of the tube recess 124 may allow for a user to more easily store a portion of the tube 108 when the oral irrigator assembly 100 is not in use. For instance, the flexible tube 108 may be easily wrapped around the tube nest 110 and be partially stored within the tube recess 124.

[0099] A design for an oral irrigator assembly 100, 1600 has been described herein. It should be noted that any of the features in the various examples and embodiments provided herein may be interchangeable and/or replaceable with any other example or embodiment. As such, the discussion of any component or element with respect to a particular example or embodiment is meant as illustrative only.

[0100] It should be noted that although the various examples discussed herein have been discussed with respect to oral irrigators, the devices and techniques may be applied in a variety of applications, such as, but not limited to, toothbrushes, washing devices, showerheads, sink apparatus, and the like.

[0101] All directional references (e.g., upper, lower, upward, downward, left, right, leftward, rightward, top, bottom, above, below, vertical, horizontal, clockwise, and counterclockwise) are

only used for identification purposes to aid the reader's understanding of the examples of the disclosure, and do not create limitations, particularly as to the position, orientation, or use of the disclosure unless specifically set forth in the claims. Joinder references (e.g., attached, coupled, connected, joined and the like) are to be construed broadly and may include intermediate members between the connection of elements and relative movement between elements. As such, joinder references do not necessarily infer that two elements are directly connected and in fixed relation to each other.

[0102] In some instances, components are described by reference to "ends" having a particular characteristic and/or being connected with another part. However, those skilled in the art will recognize that the embodiments are not limited to components which terminate immediately beyond their point of connection with other parts. Thus the term "end" should be broadly interpreted, in a manner that includes areas adjacent rearward, forward of or otherwise near the terminus of a particular element, link, component, part, member or the like.

[0103] In methodologies directly or indirectly set forth herein, various steps and operations are described in one possible order of operation but those skilled in the art will recognize the steps and operation may be rearranged, replaced or eliminated without necessarily departing from the spirit and scope of the present disclosure. It is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative only and not limiting. Changes in detail or structure may be made without departing from the broad understanding of the embodiments as defined in the appended claims.

CLAIMS

1. An oral irrigator assembly comprising:

a base unit including a first positioning feature;

an oral irrigator handle including a second positioning feature corresponding with the first positioning feature of the base unit to removably couple the oral irrigator handle to the base unit;

a tube nest coupled to the base unit; and

a tube that is coupled to the oral irrigator handle and is configured to be stored around the tube nest;

wherein:

the first positioning feature is a first magnet device coupled to the base unit;

the second positioning feature of the oral irrigator handle is a second magnet device configured to engage with the first magnet device to magnetically couple the oral irrigator handle to the base unit;

a portion of the tube nest extends away from a front face of the base unit to form a protrusion; and

an interface between the protrusion and the front face of the base unit forms a tube recess, the tube recess having a width that is larger than a diameter of the tube.

2. The oral irrigator assembly of claim 1, wherein the first magnet device is defined as or positioned within a cradle configured to at least partially receive the oral irrigator handle therein.

3. The oral irrigator assembly of claim 2, wherein the cradle includes a shape complementary to that of the oral irrigator handle.

4. The oral irrigator assembly of claim 1, wherein the first and second positioning features align the oral irrigator handle into a correct storage position adjacent to the base unit.

5. The oral irrigator assembly of claim 1, wherein the oral irrigator handle automatically aligns into a storage position due to a magnetic attachment between the oral irrigator handle and the base unit.

6. The oral irrigator assembly of claim 1, wherein the first and second positioning features removably couple the oral irrigator handle to the base unit at any one of a plurality of vertically adjacent positions relative to the base unit.

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7. The oral irrigator assembly of claim 1, further comprising a control assembly comprising

a first element arranged to selectively alter a first operating state of the oral irrigator assembly; and

a second element arranged to rotate at least partially about the first element to selectively alter a second operating state of the oral irrigator assembly.

8. The oral irrigator assembly of claim 7, wherein

the first element is a push button operable to turn the oral irrigator assembly on and off; and

the second element is a knob operably coupled to a control valve to adjust at least one of a pressure and a volume of a fluid expelled through the oral irrigator handle.

9. The oral irrigator assembly of claim 8, wherein the knob circumferentially surrounds the push button.

10. The oral irrigator assembly of claim 7, wherein the first element moves axially along an axis about which the second element rotates.

11. The oral irrigator assembly of claim 7, wherein at least a portion of the first element extends through the second element.

12. An oral irrigator assembly comprising:

a base including a pressure assembly, wherein the base includes a protrusion extending from a front face thereof;

a fluid reservoir removably coupled to the base;

an oral irrigator handle fluidly coupled to the fluid reservoir and the pressure assembly, the oral irrigator handle magnetically coupled to the base;

a cradle defined within a front portion of the protrusion to at least partially receive the oral irrigator handle therein;

a tube fluidly connecting the oral irrigator handle to the fluid reservoir and the pressure assembly, wherein an interface between the protrusion and the front face of the base forms a tube recess for at least partial receipt of the tube therein, wherein the tube wraps about the protrusion when the oral irrigator handle is magnetically coupled to the base; and

a control assembly including a push button at least partially surrounded by a knob, wherein the push button includes a leg arranged to extend through a housing of the base and selectively engage a power button to turn the oral irrigator assembly on and off, and wherein the knob is

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coupled to the pressure assembly to adjust at least one of a pressure and a volume of a fluid expelled through the oral irrigator handle upon movement of the knob.

13. The oral irrigator assembly of claim 12, wherein selective movement of the knob adjusts both the pressure and the volume of the fluid expelled through the oral irrigator handle.

14. The oral irrigator assembly of claim 12, wherein

the cradle includes a first magnet device; and

the oral irrigator handle includes a second magnet device corresponding with the first magnet device of the cradle to magnetically couple the oral irrigator handle to the cradle at a desired position.

15. The oral irrigator assembly of claim 14, wherein the first and second magnet devices allow the oral irrigator handle to be magnetically coupled to the cradle at any one of a plurality of desired positions relative to the cradle.

16. The oral irrigator assembly of claim 12, further comprising a tube routing aperture formed in a bottom portion of the base for at least partial receipt of the tube therein.

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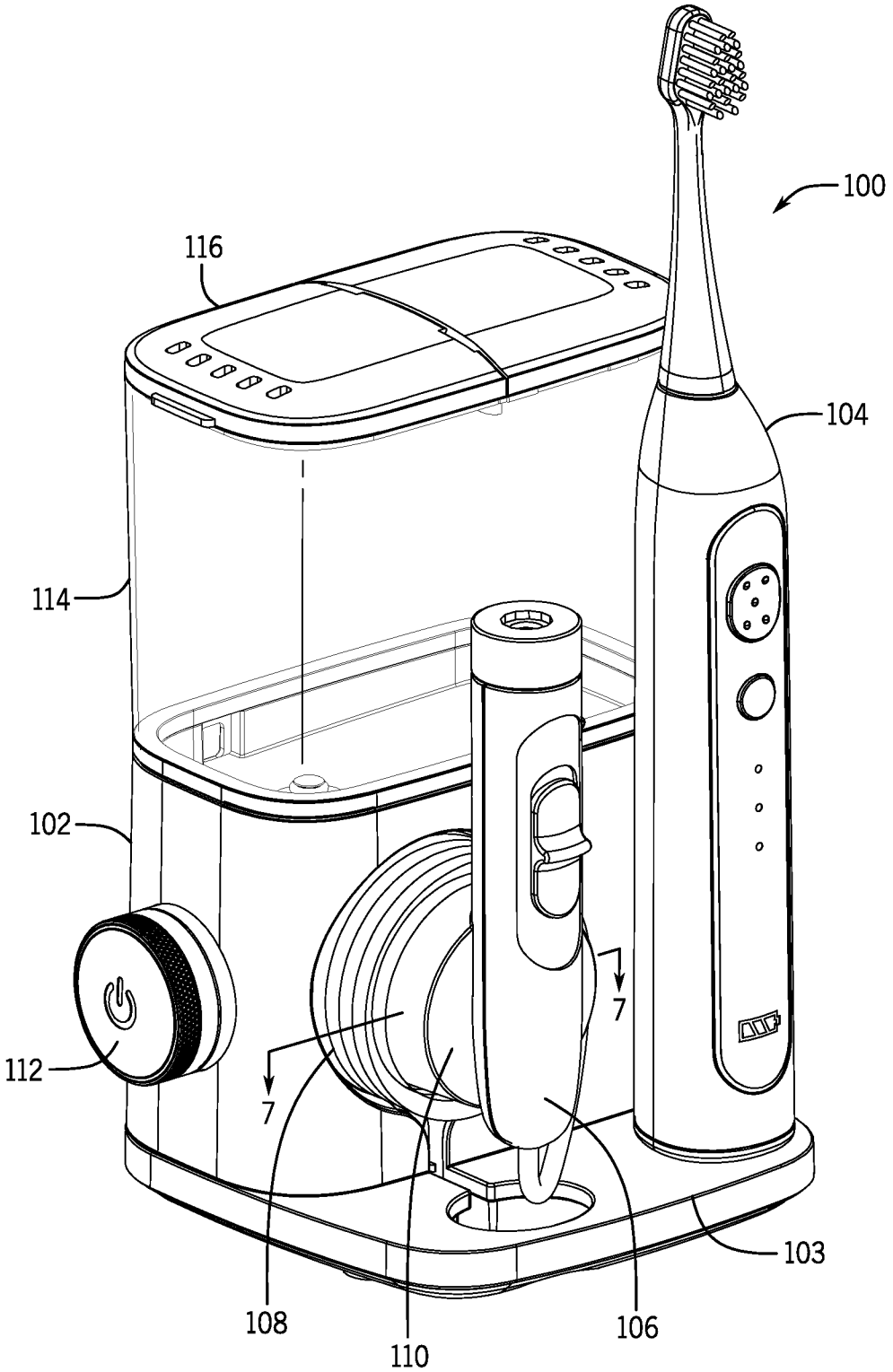


FIG. 1

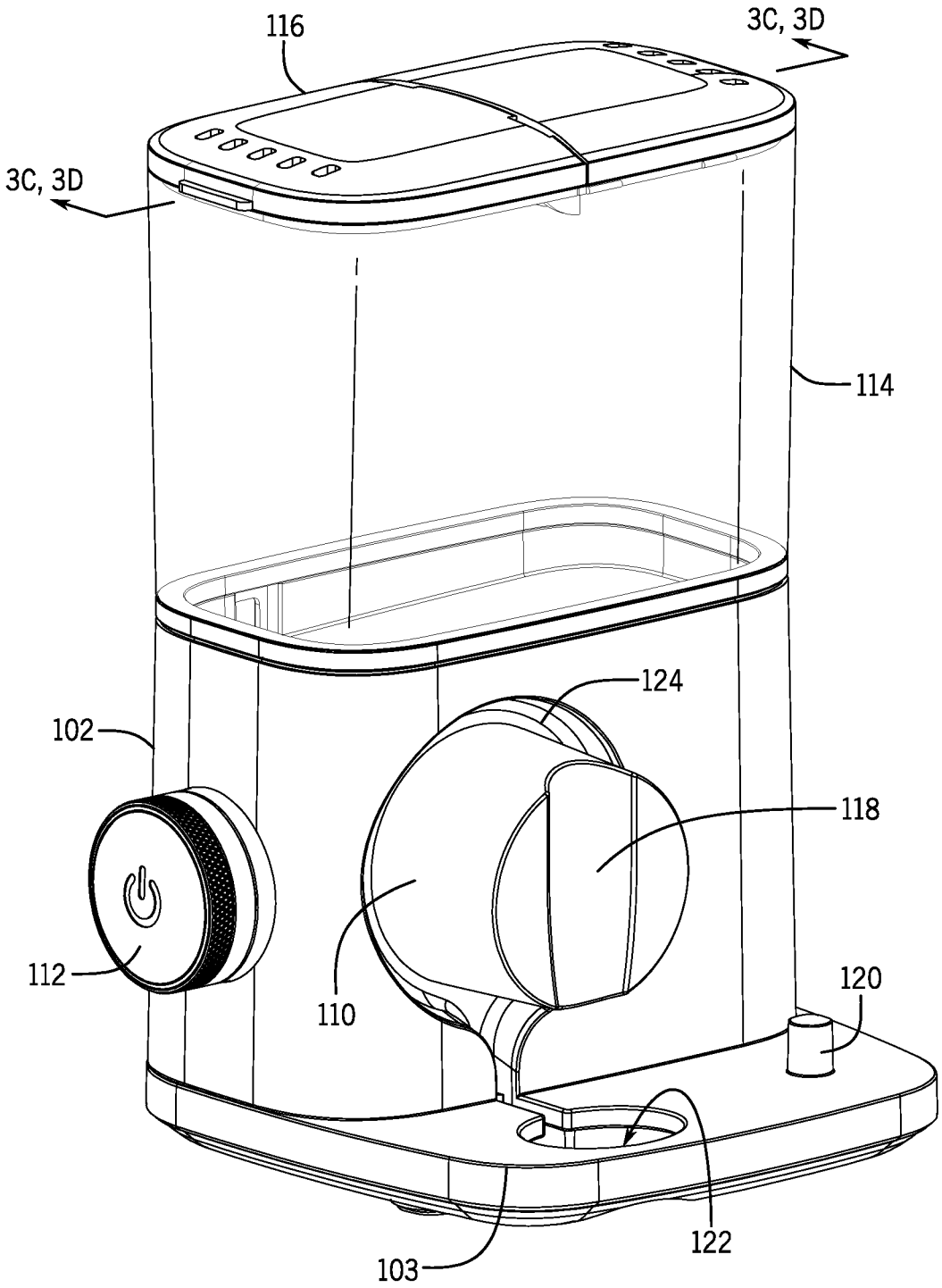


FIG. 2

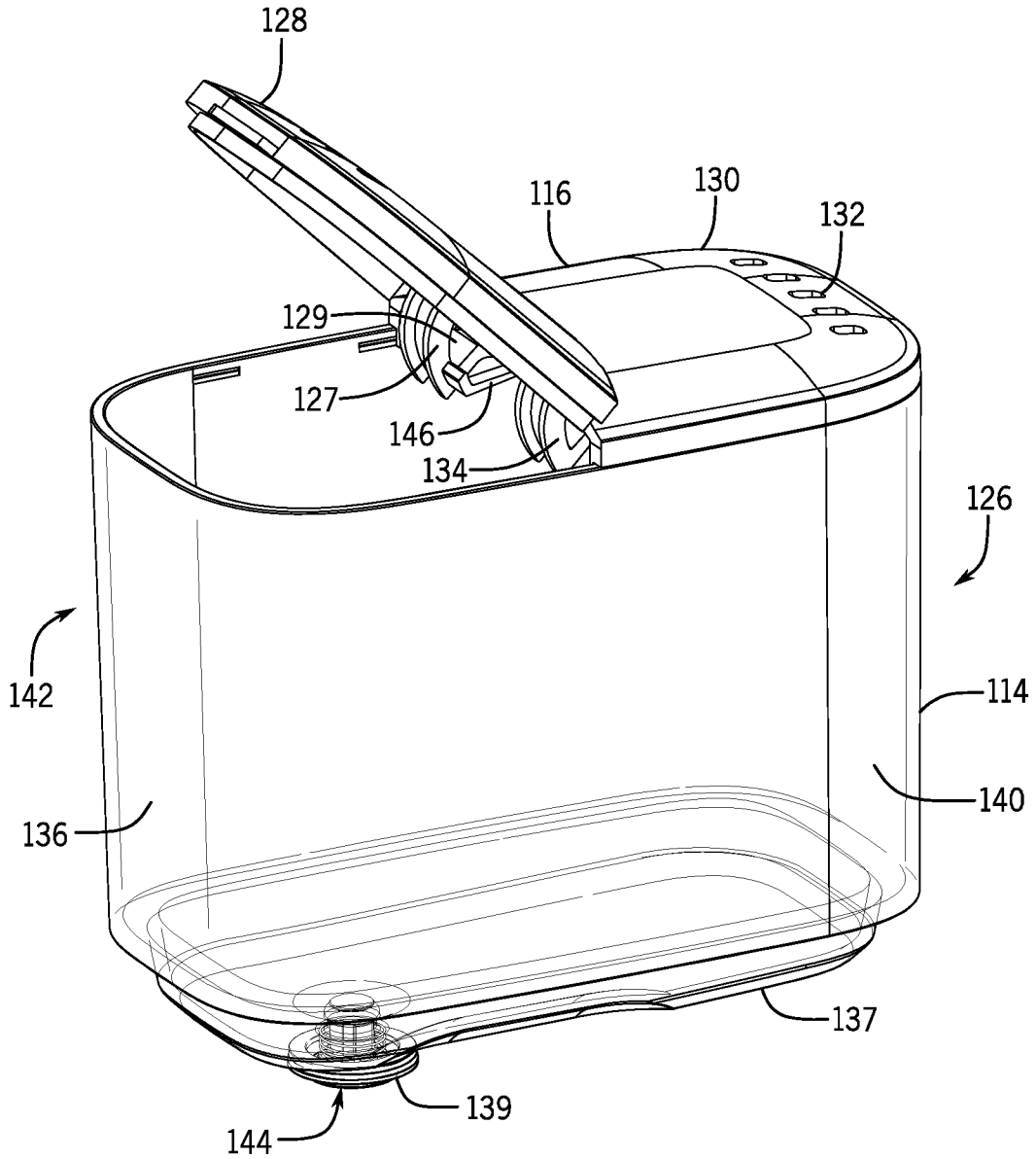


FIG. 3A

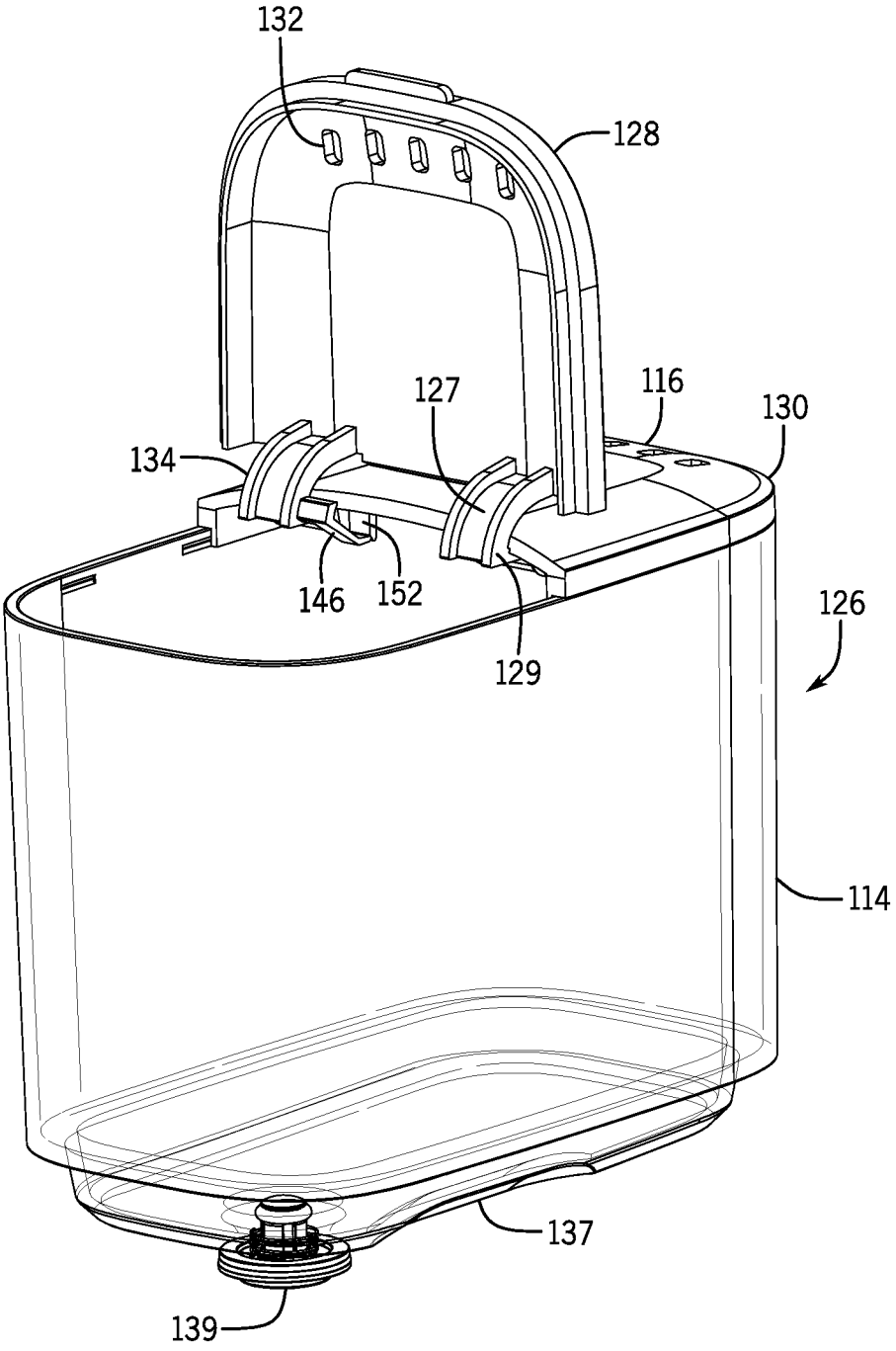


FIG. 3B

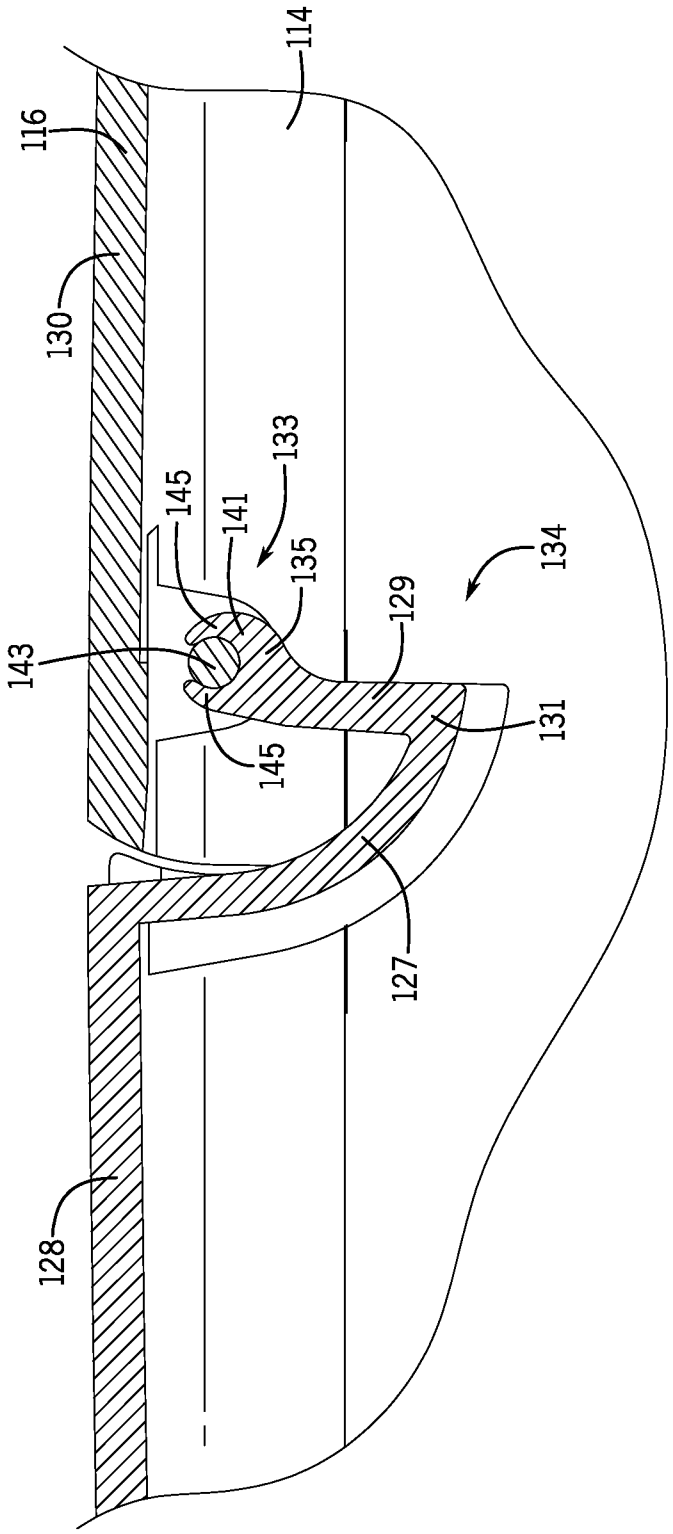


FIG. 3C

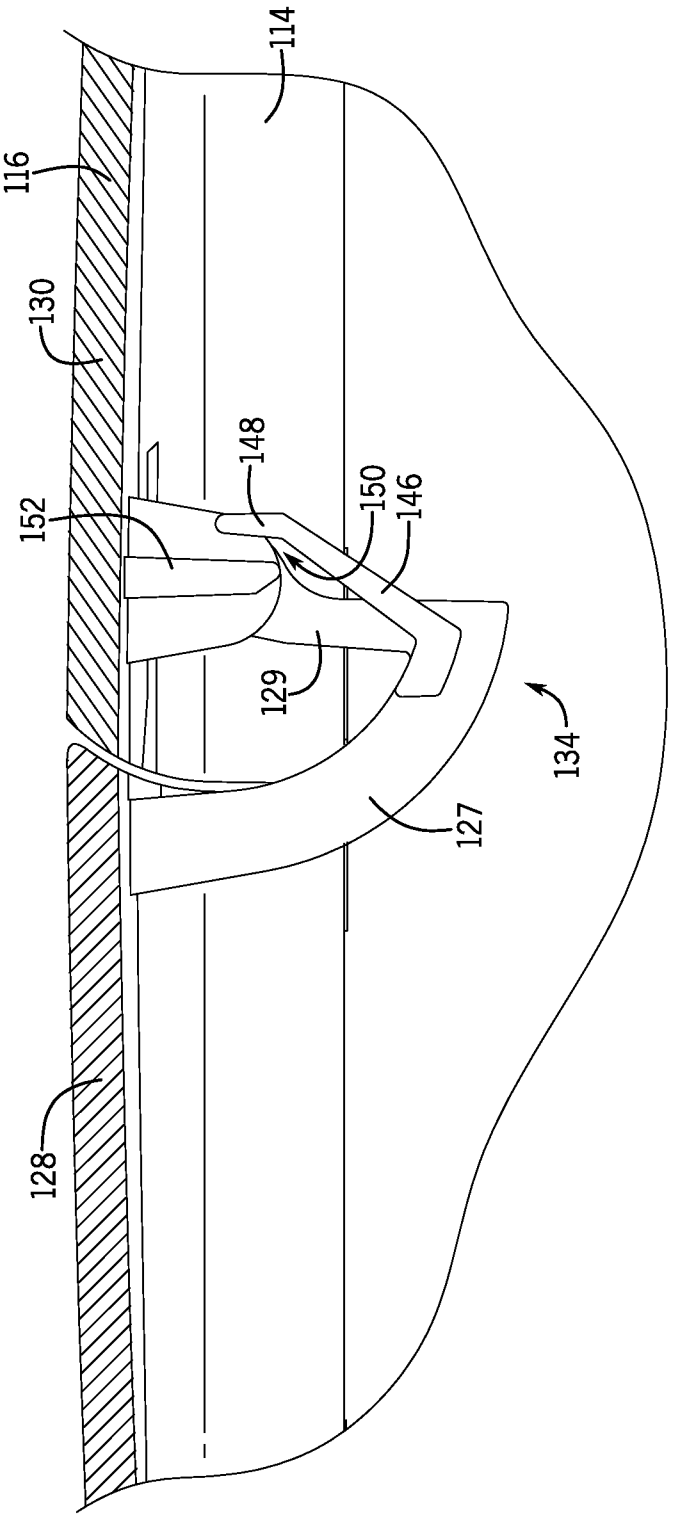


FIG. 3D

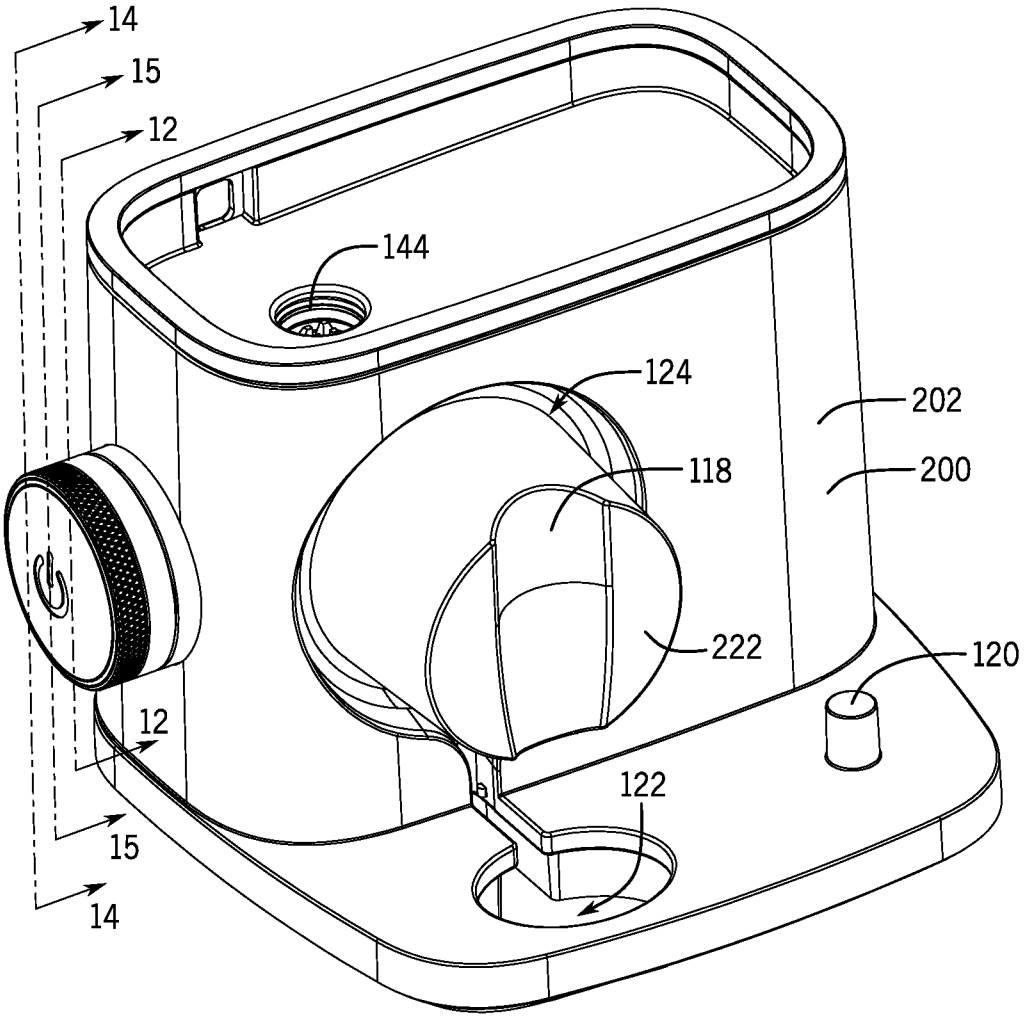


FIG. 4

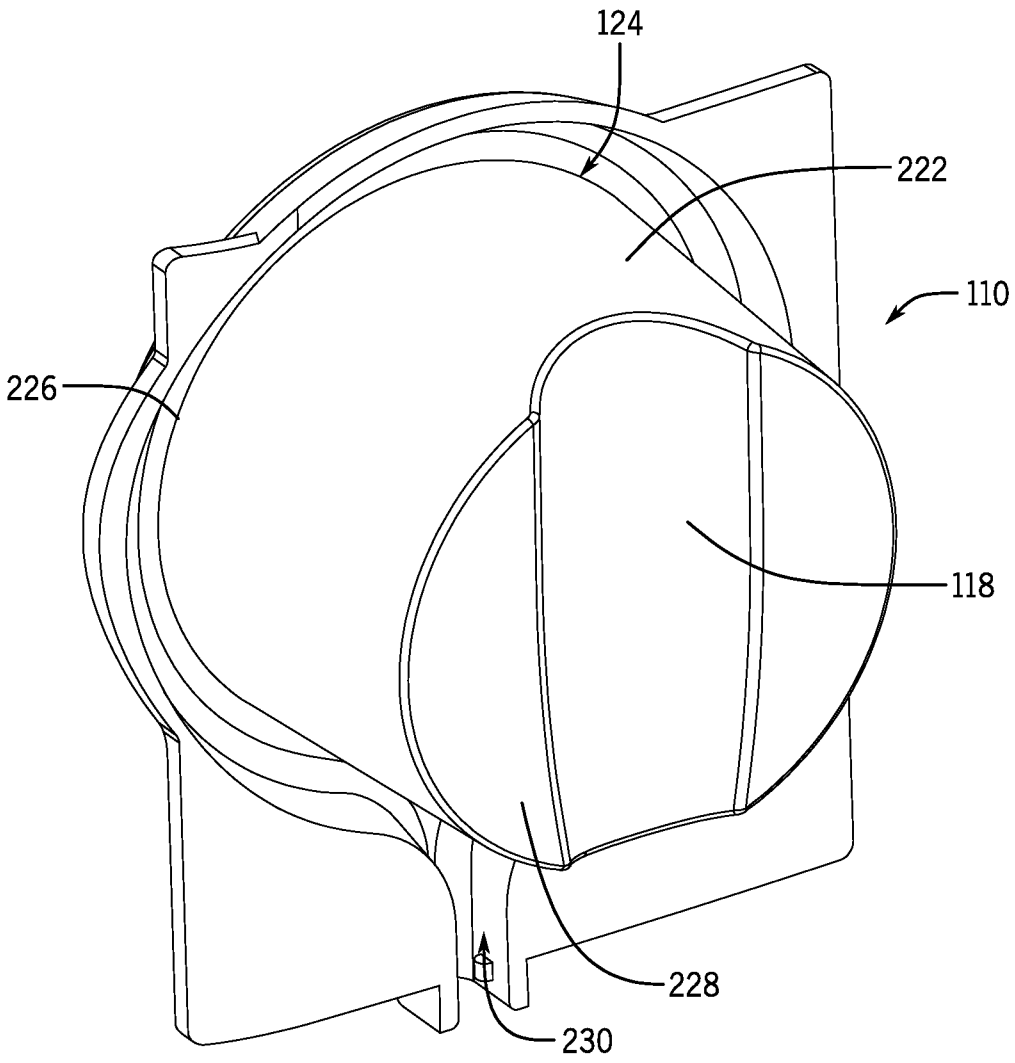


FIG. 5

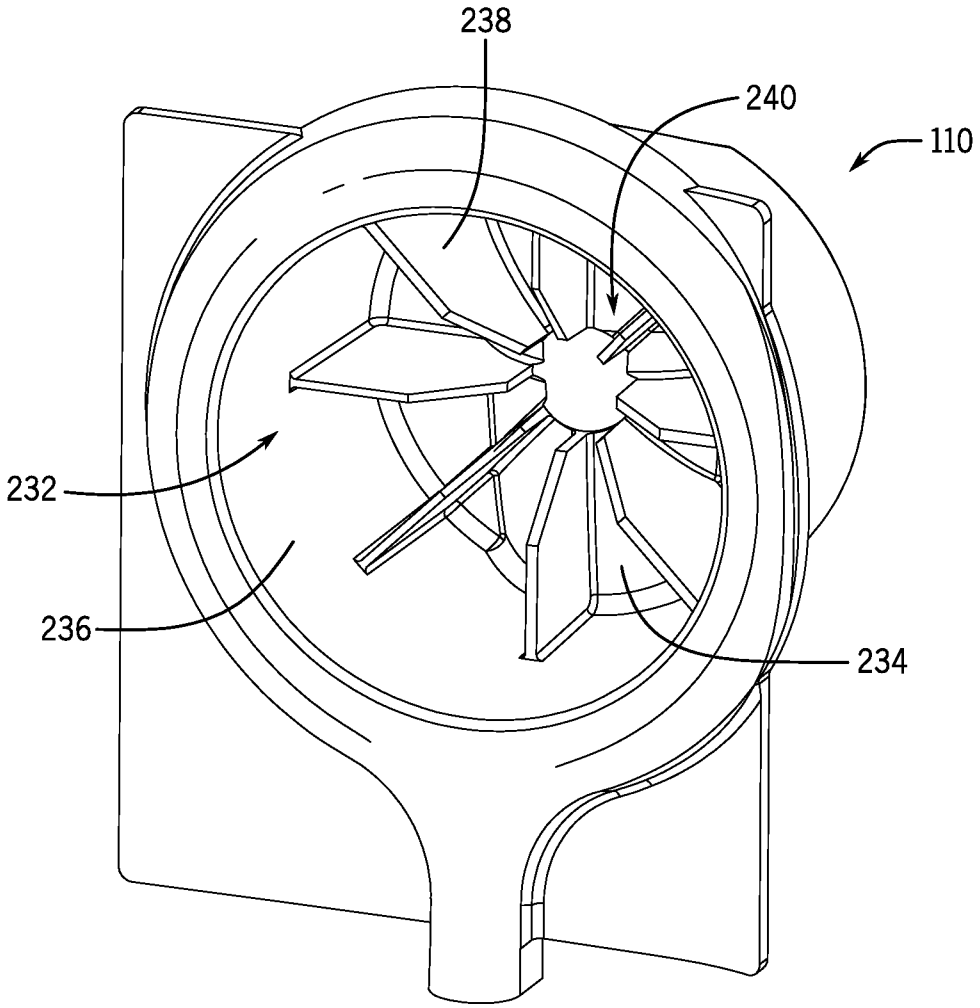


FIG. 6

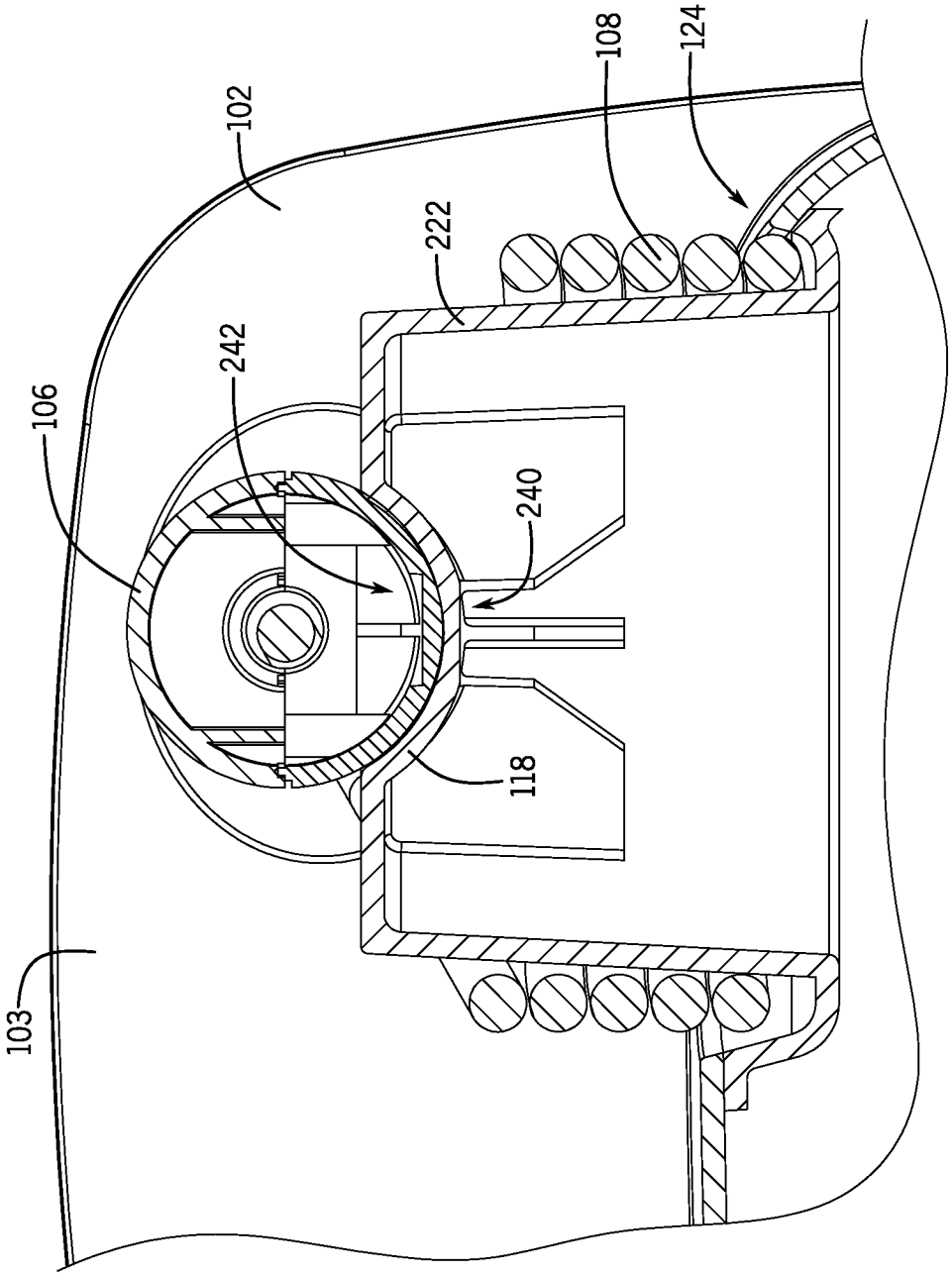


FIG. 7

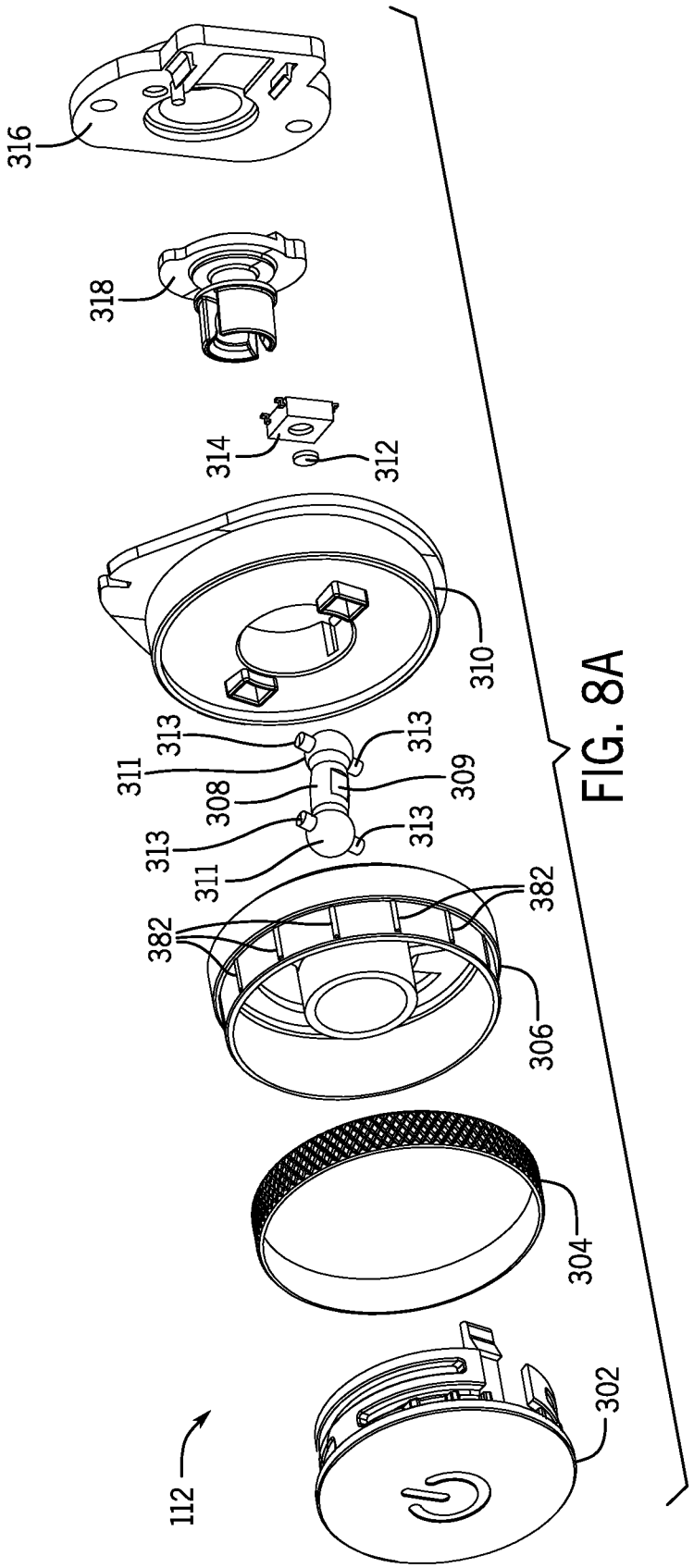

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FIG. 8A

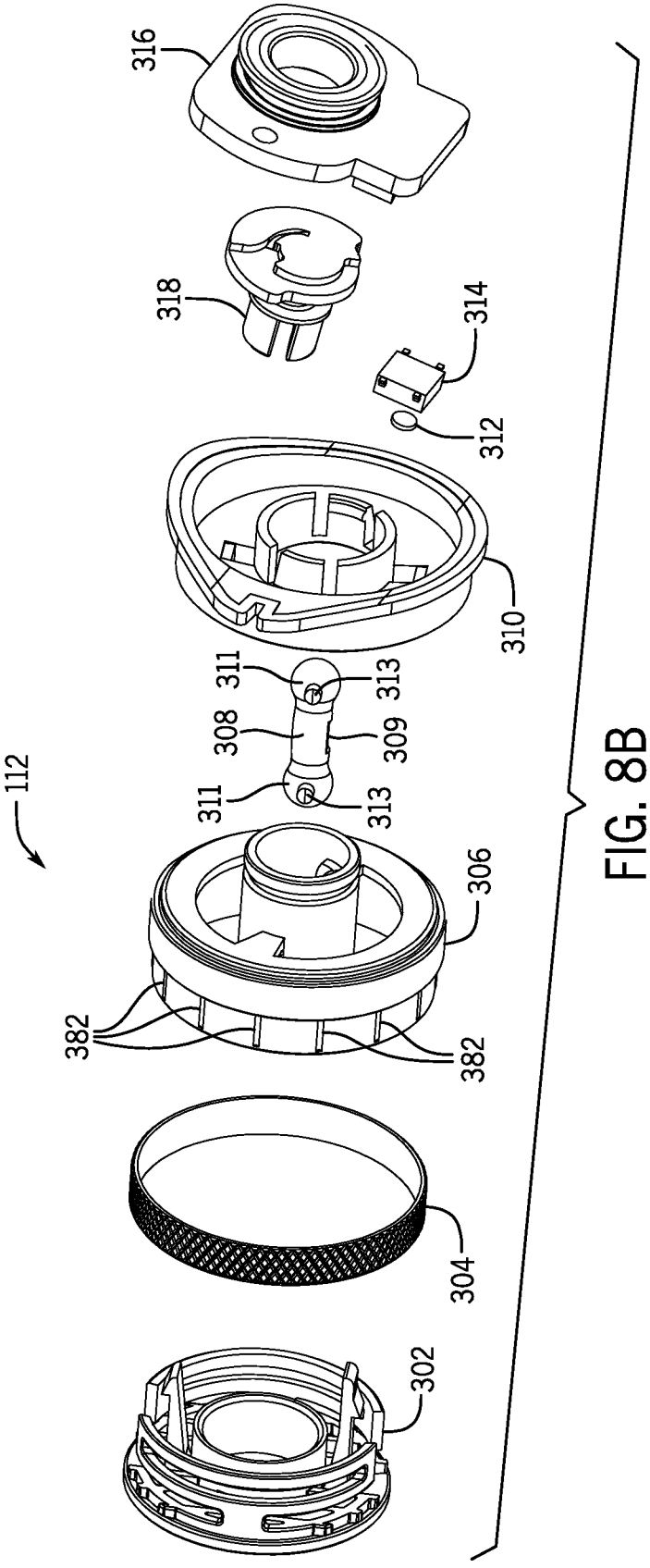

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FIG. 8B

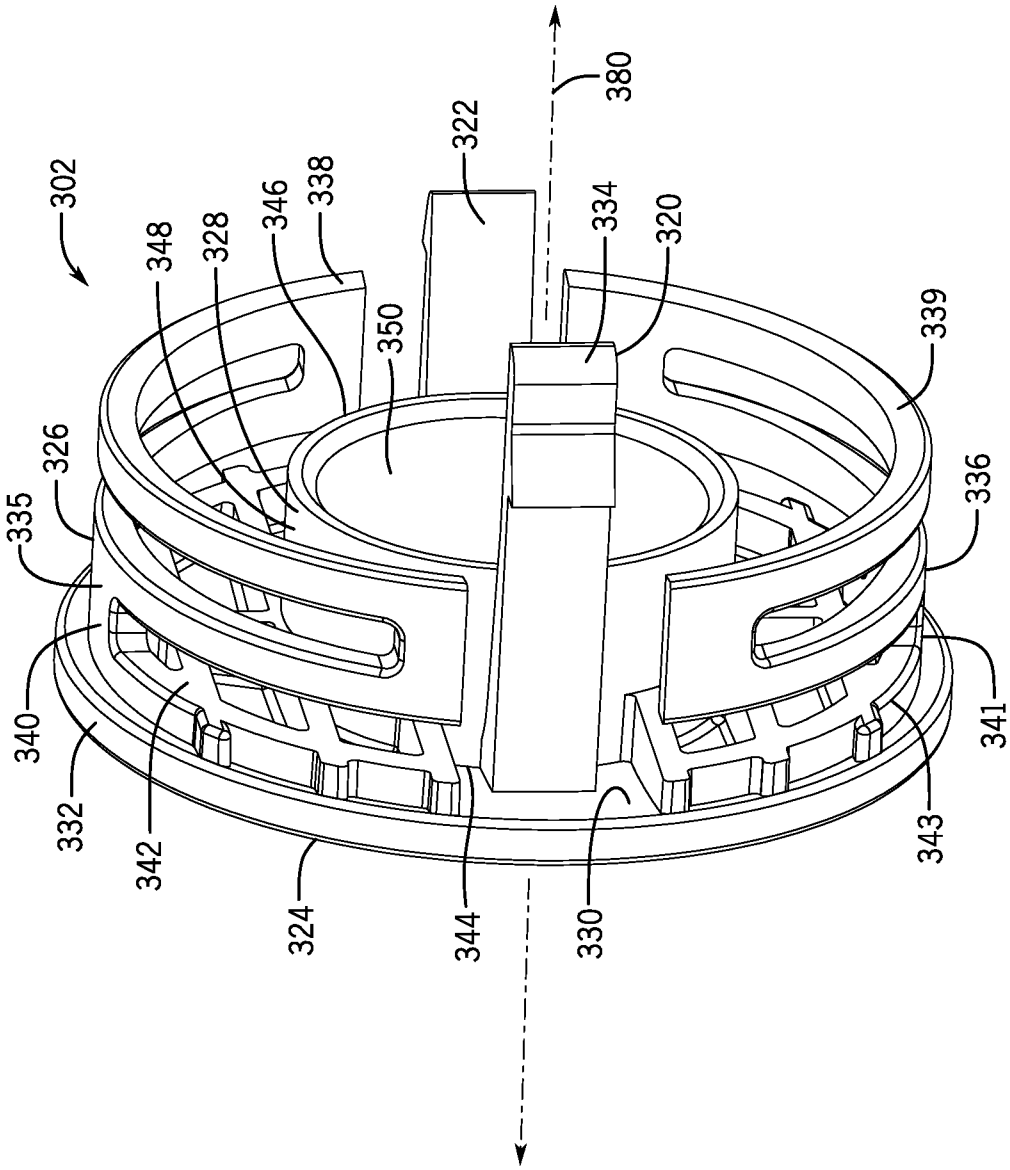

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FIG. 9

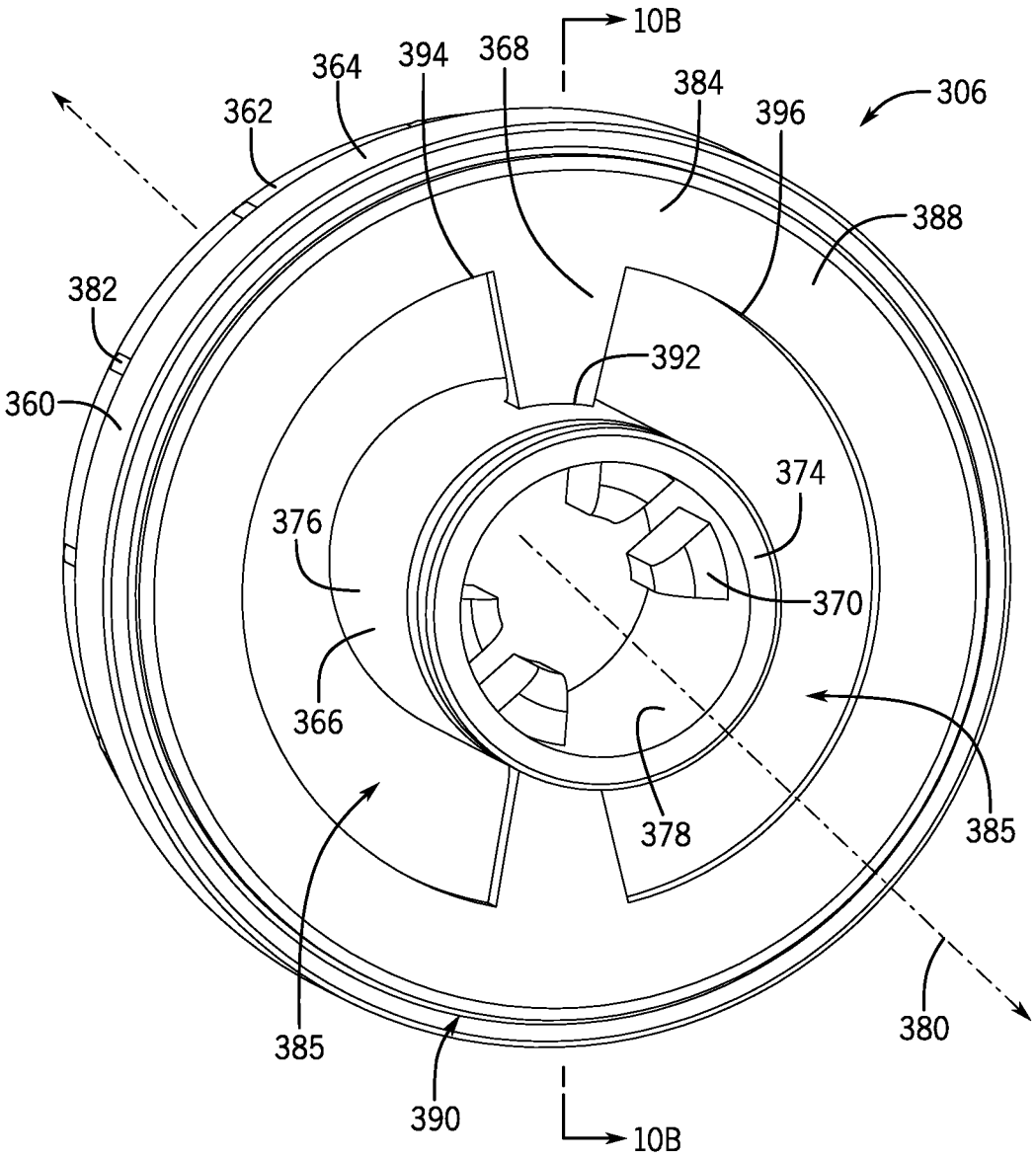

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FIG. 10A

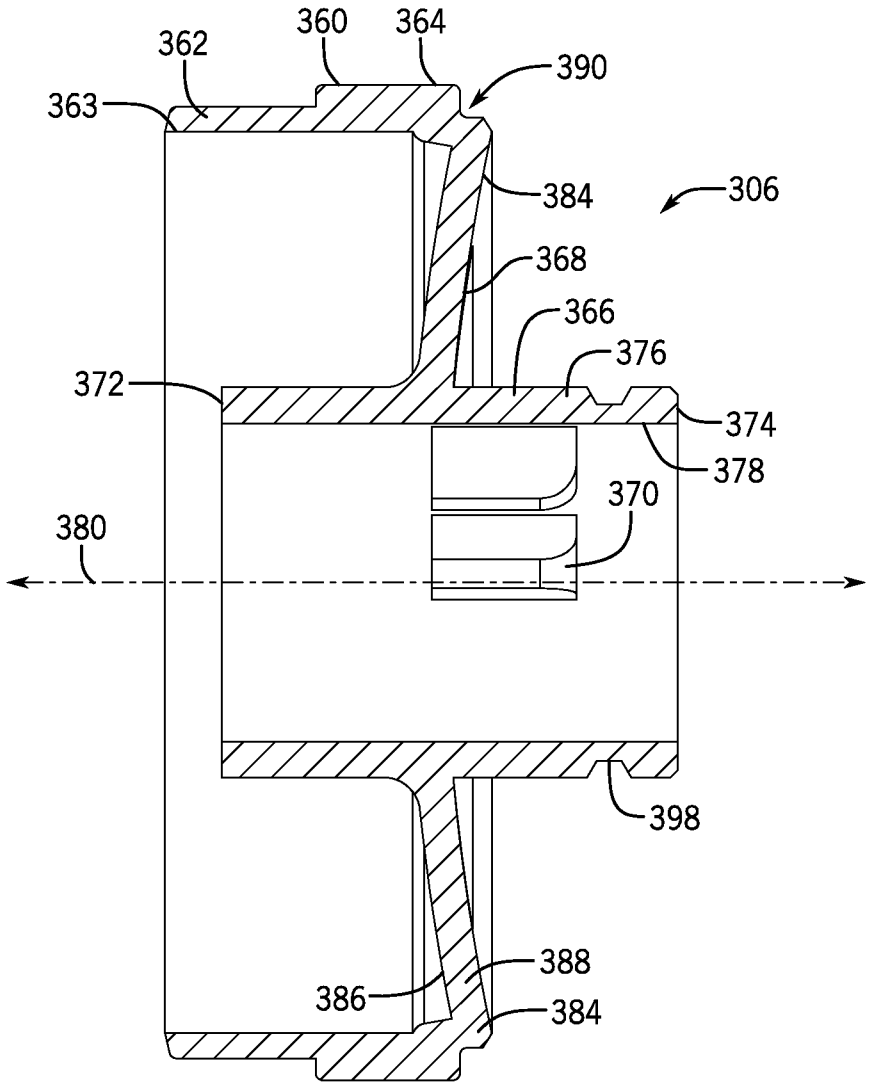

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FIG. 10B

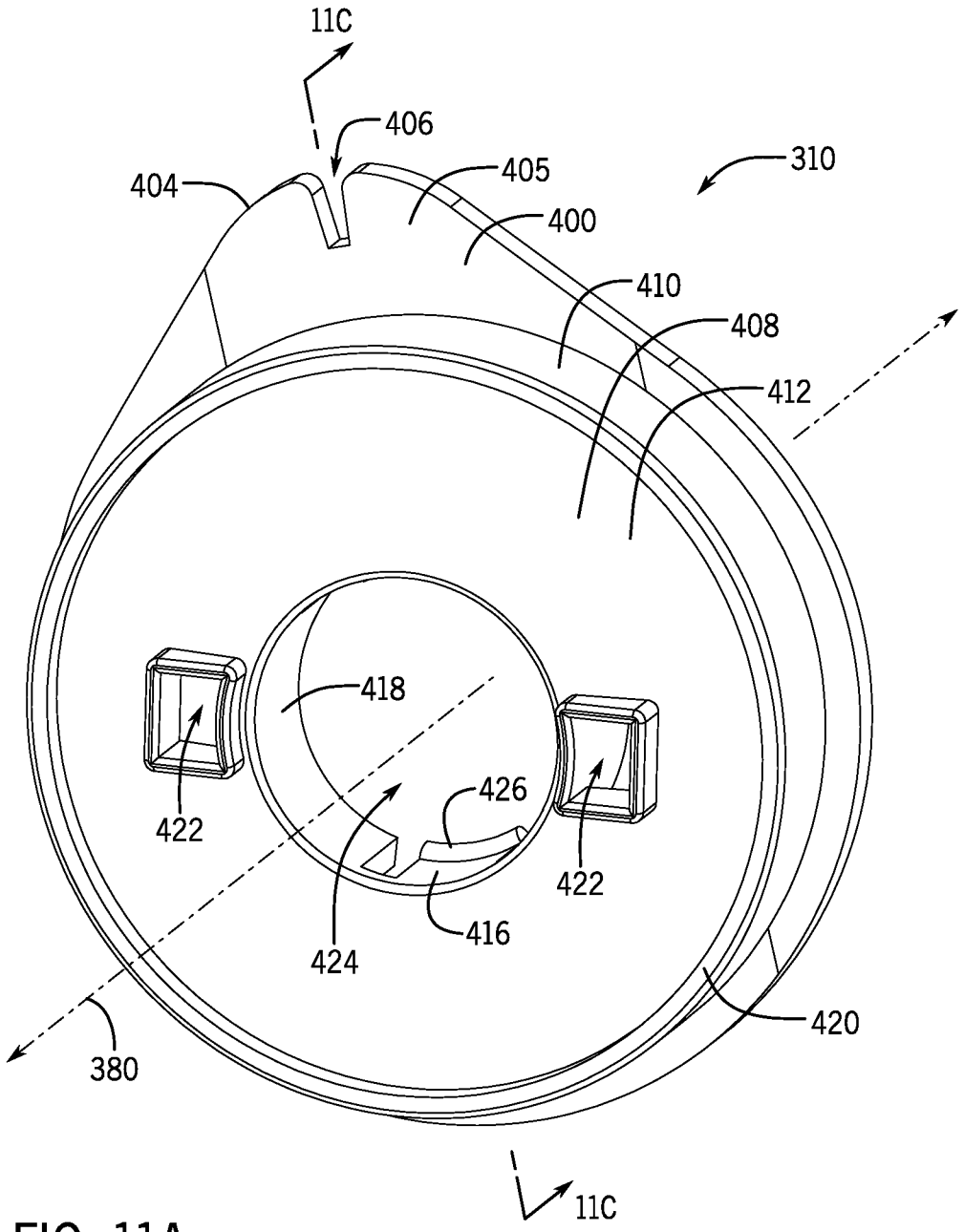

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FIG. 11A

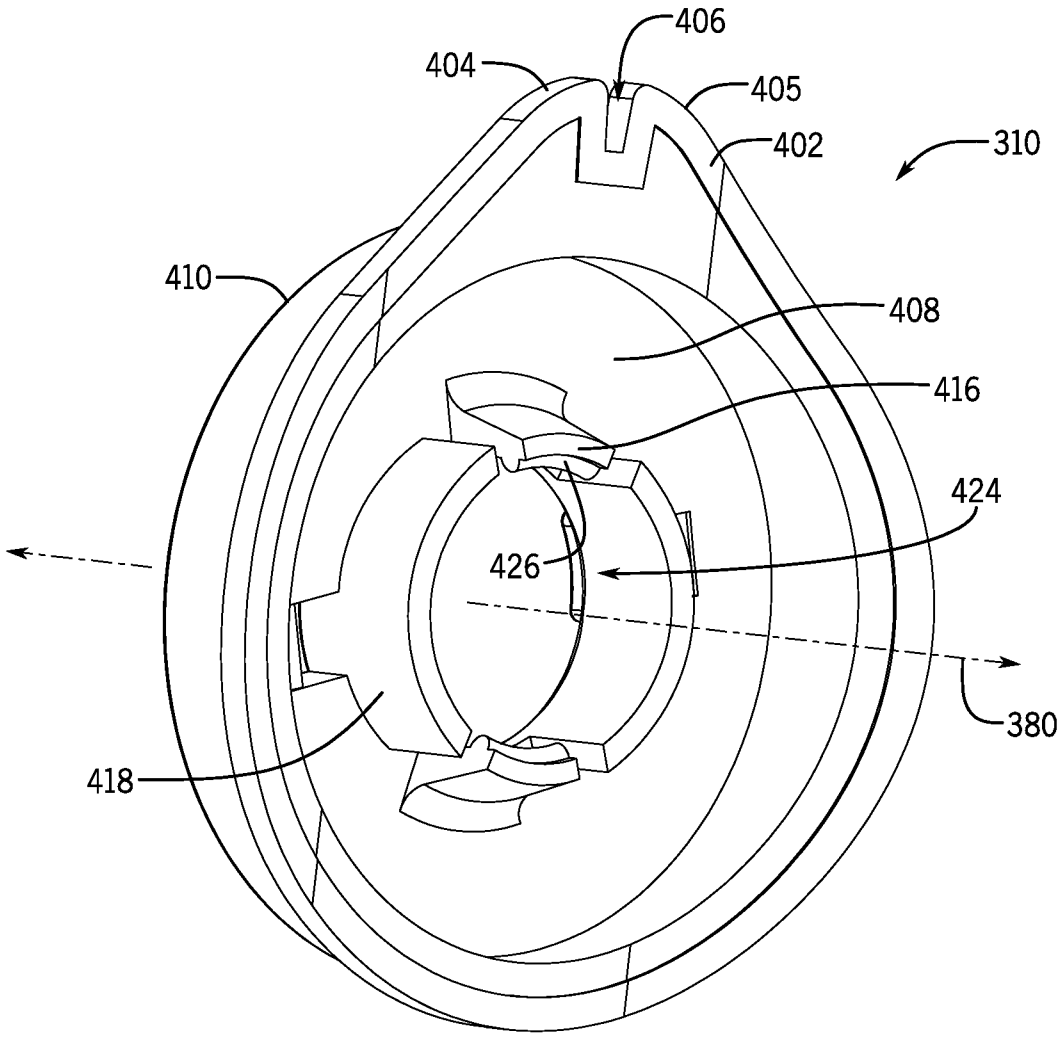


FIG. 11B

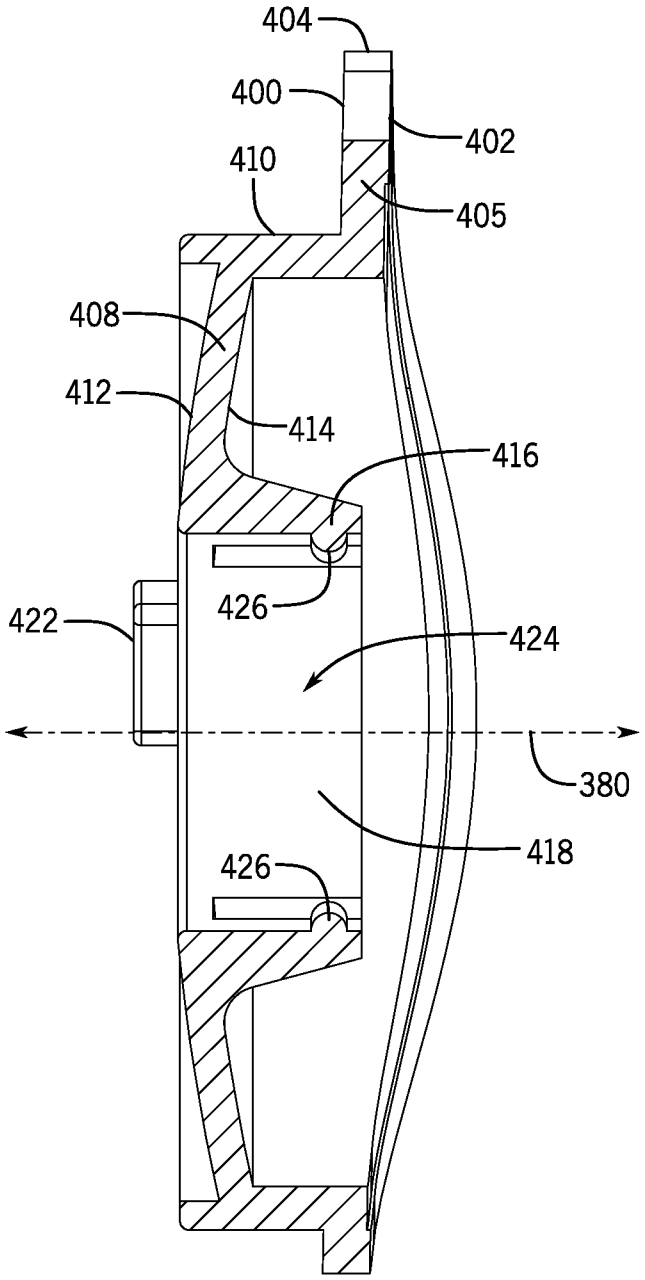


FIG. 11C

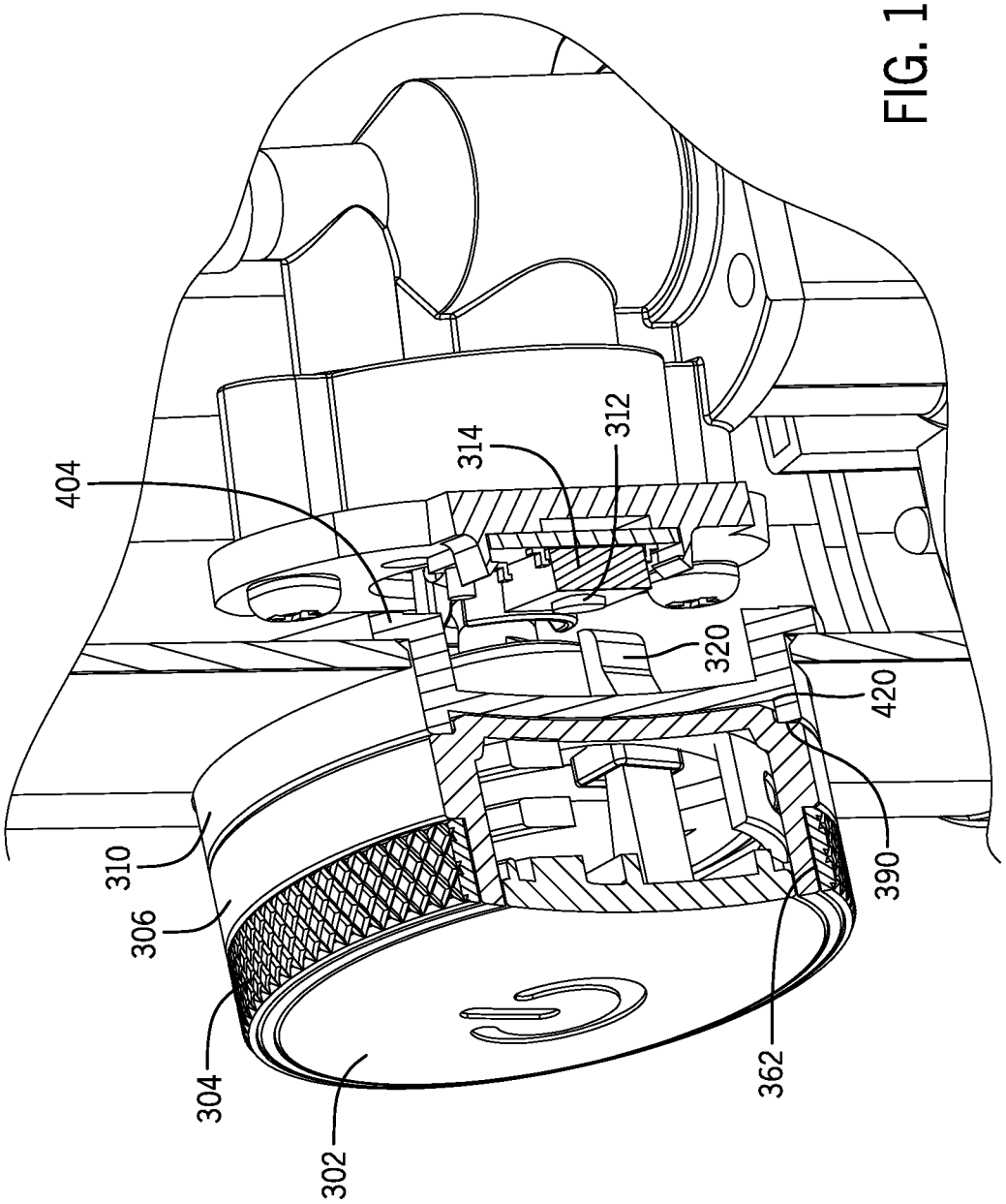


FIG. 12

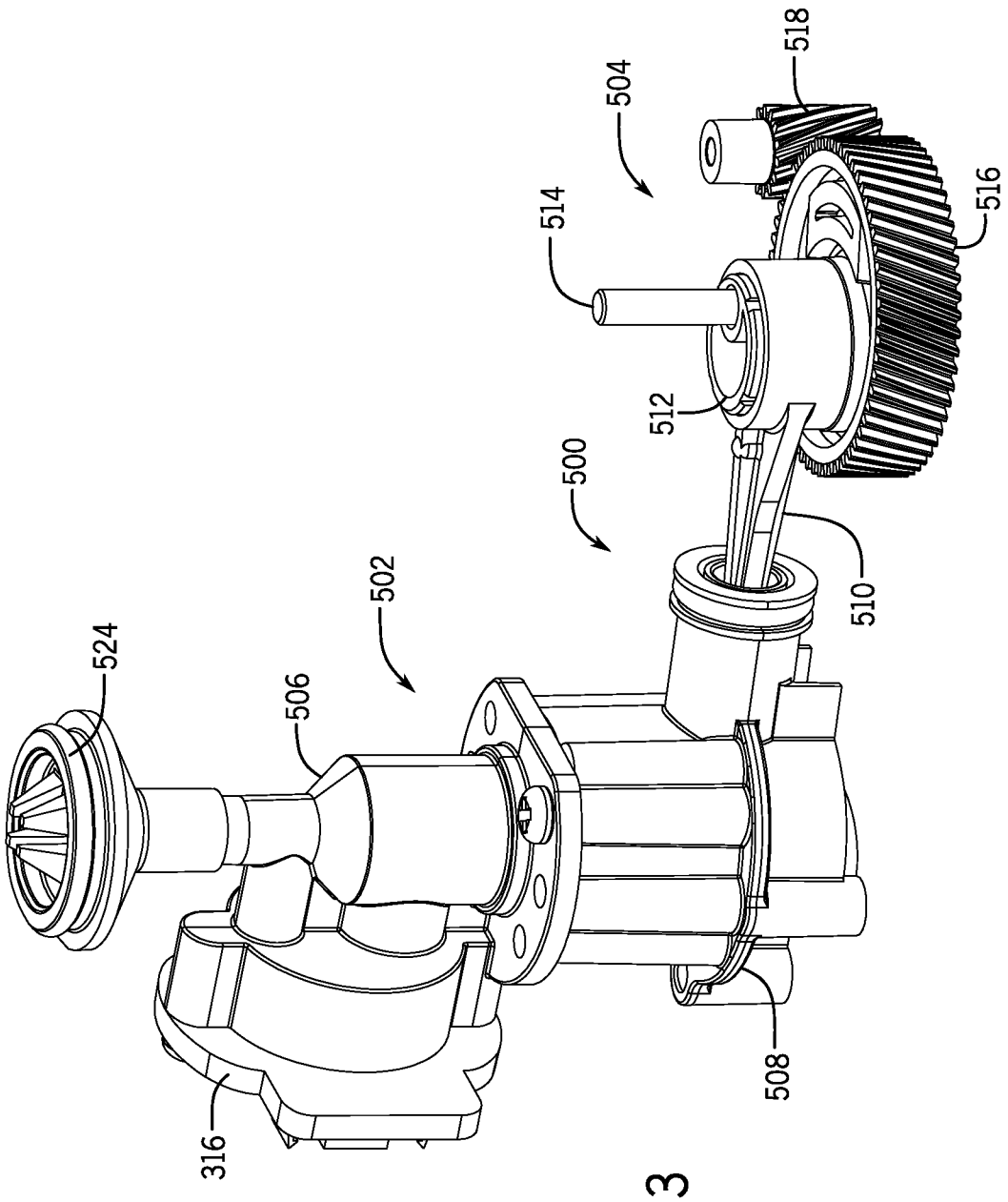


FIG. 13

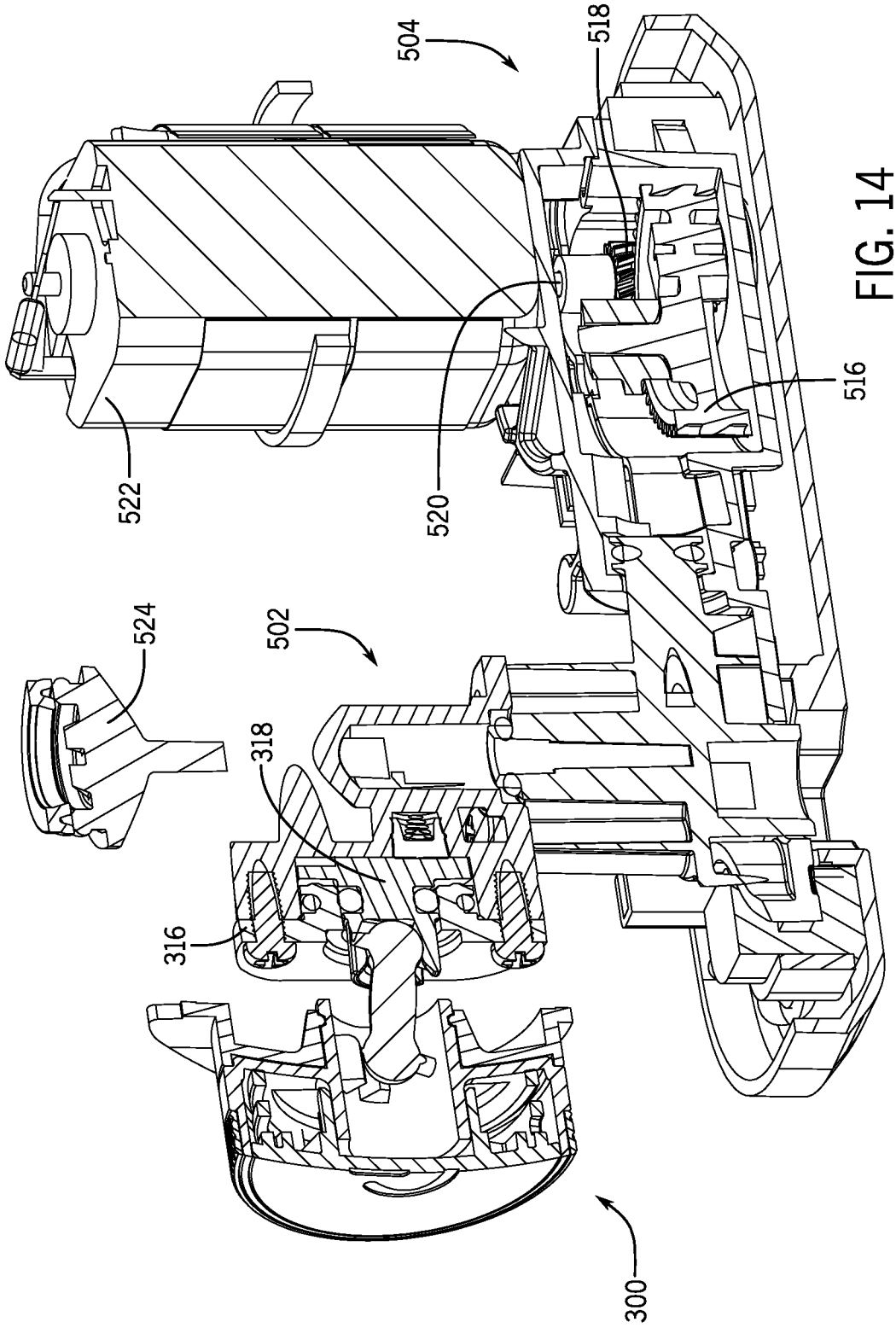


FIG. 14

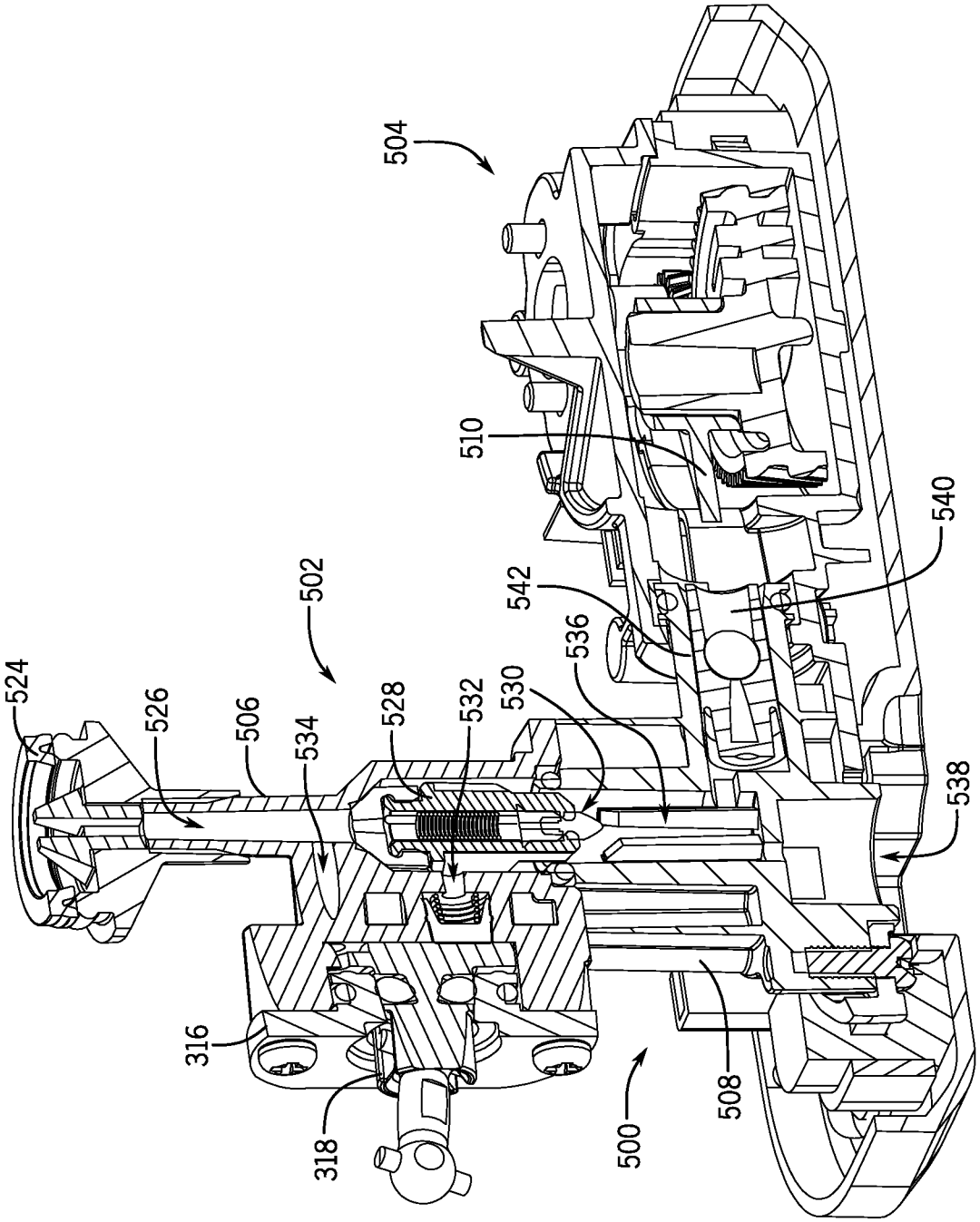

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FIG. 15

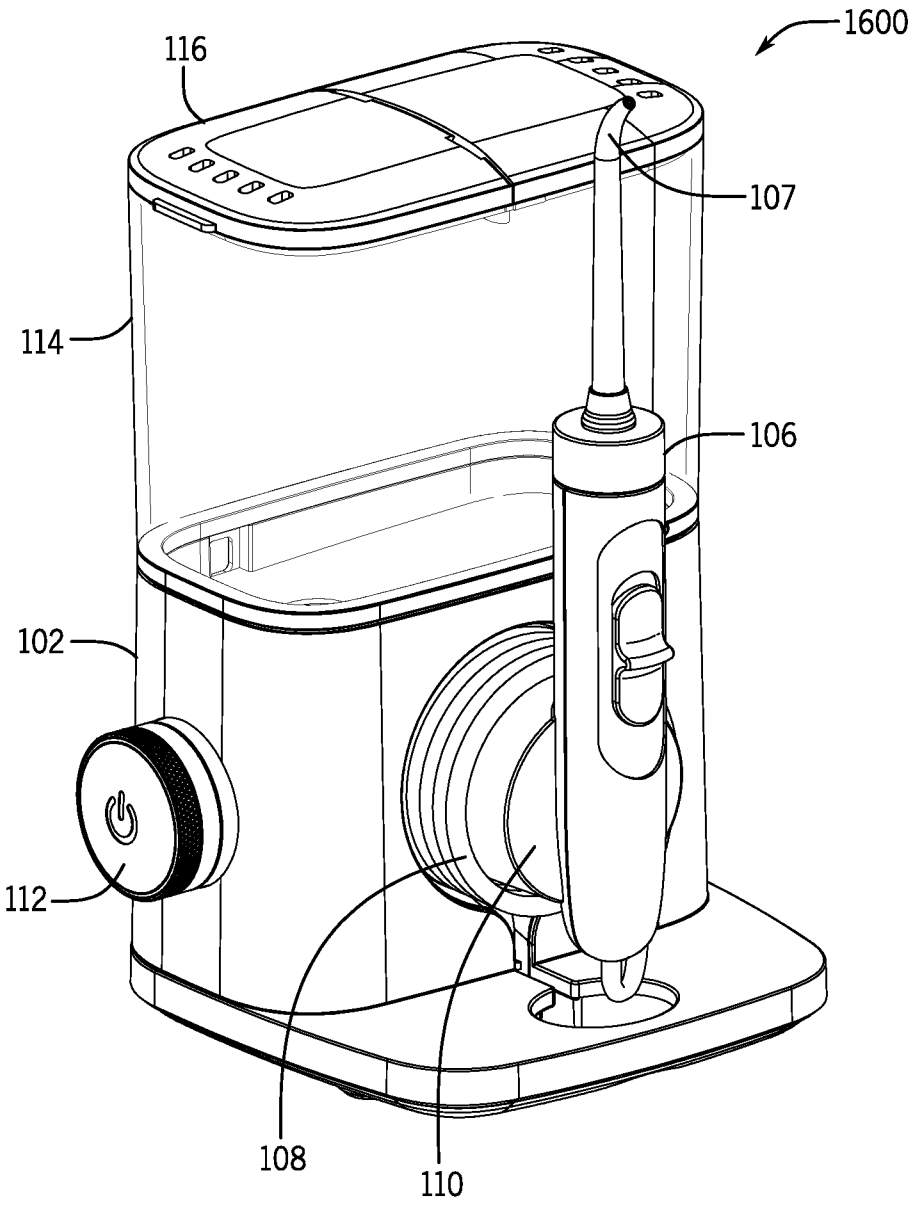
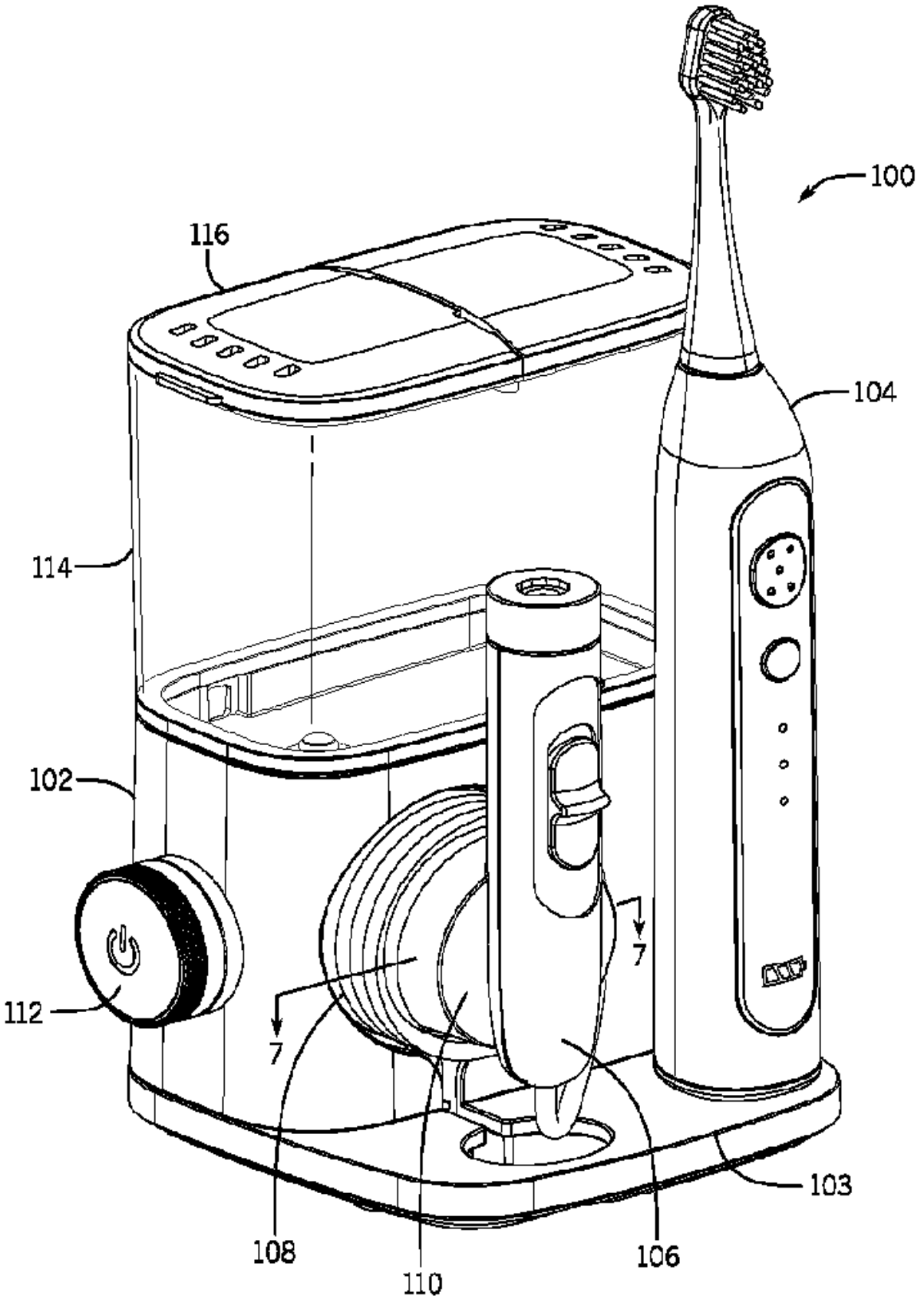


FIG. 16


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