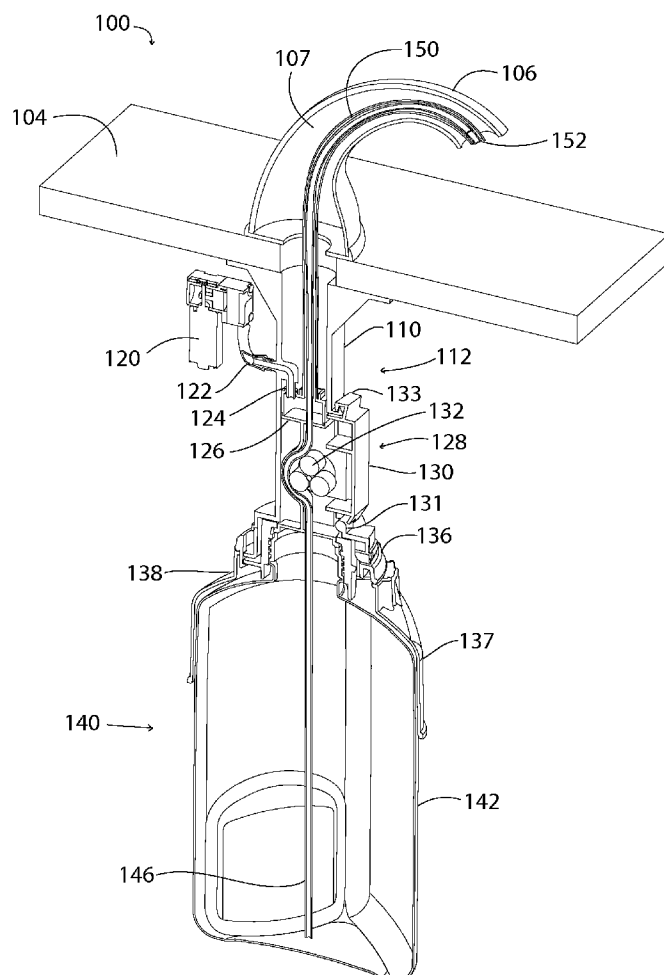




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(19) **United States**(12) **Patent Application Publication**
Ciavarella et al.(10) **Pub. No.: US 2014/0124540 A1**(43) **Pub. Date: May 8, 2014**(54) **UNDER-COUNTER MOUNT FOAM
DISPENSING SYSTEMS WITH PERMANENT
AIR COMPRESSORS AND REFILL UNITS
FOR SAME****Publication Classification**(51) **Int. Cl.**
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(US)(21) Appl. No.: **13/792,024**(22) Filed: **Mar. 9, 2013****Related U.S. Application Data**(60) Provisional application No. 61/723,468, filed on Nov.
7, 2012.(57) **ABSTRACT**

Under-counter foam dispensing systems and refill units for under-counter mount foam dispensing systems are disclosed herein. An exemplary refill unit includes a container for holding a liquid, at least a portion of a liquid pump, a quick-connect air manifold for releasably connecting to a pressurized air source, an air passage to a mixing chamber and a liquid passage to the mixing chamber. The air inlet is in fluid communication with the source for pressurized air when the refill unit is mounted in the dispensing system and disengages from the pressurized air source when the refill unit is removed from the under-counter mount foam dispensing system.



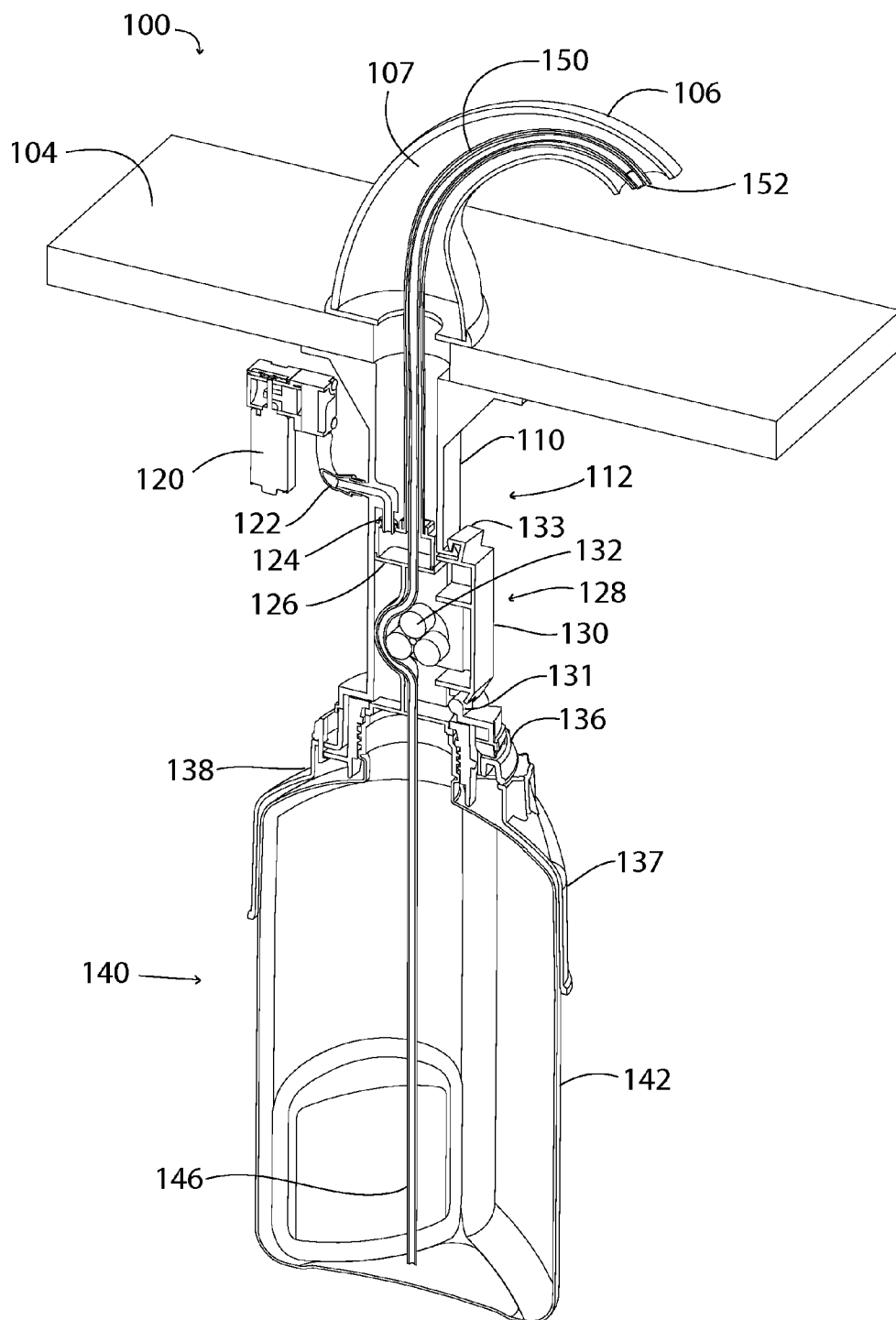


FIG. 1

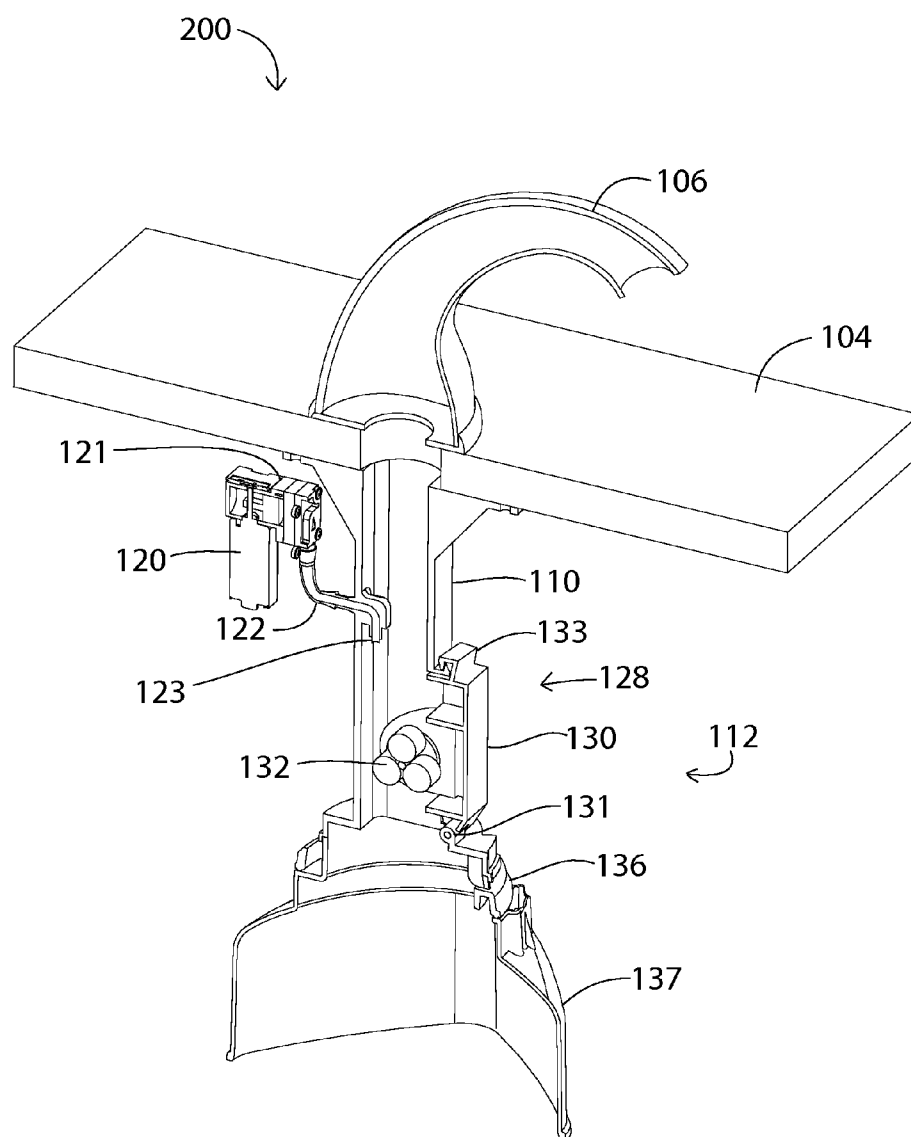


FIG. 2

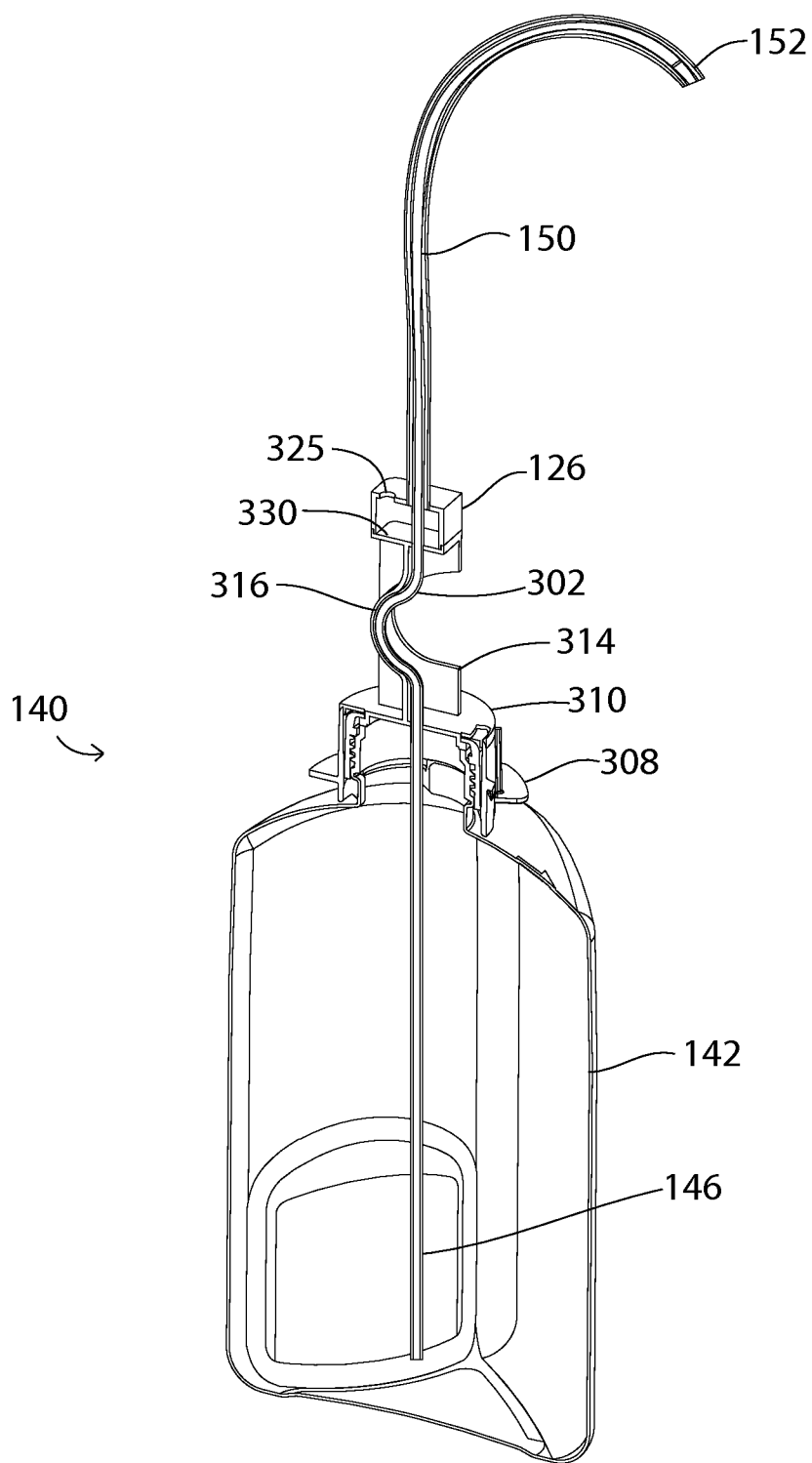


FIG. 3

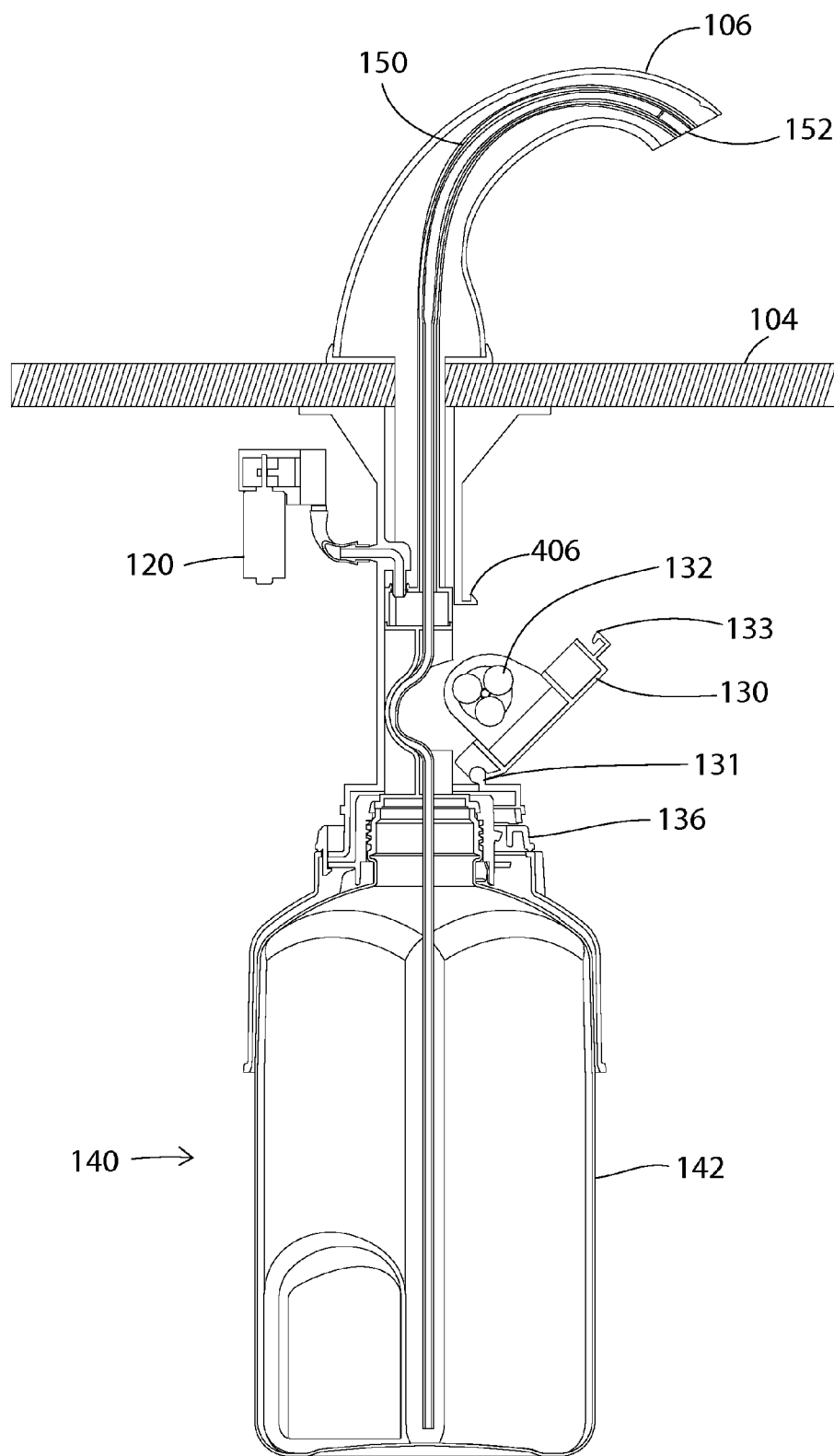


FIG. 4

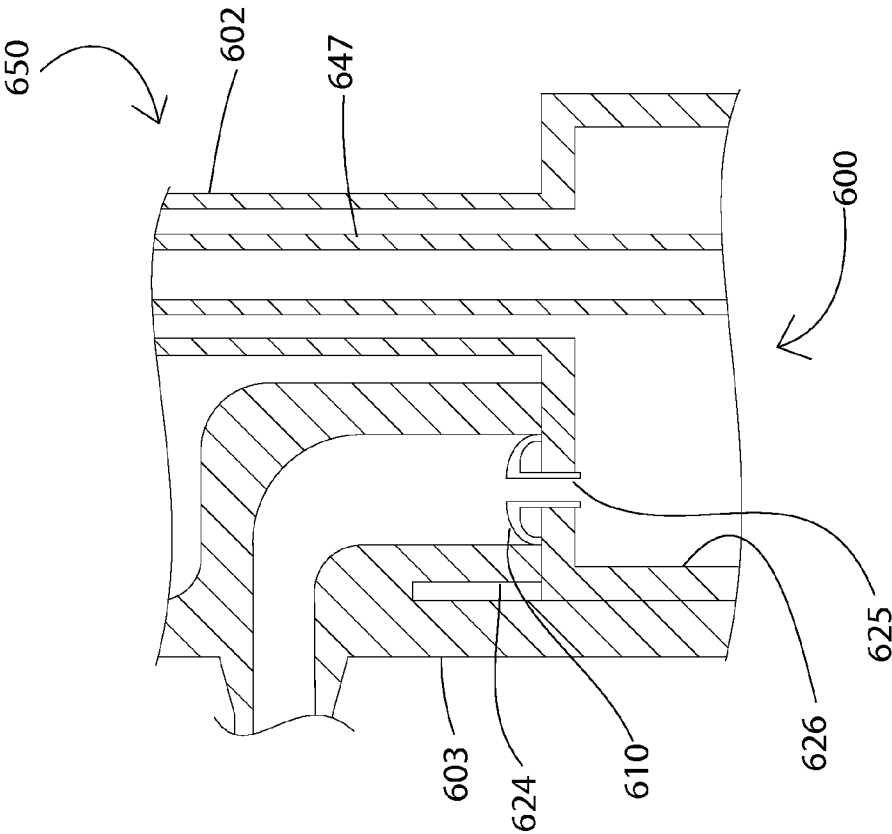


FIG. 6

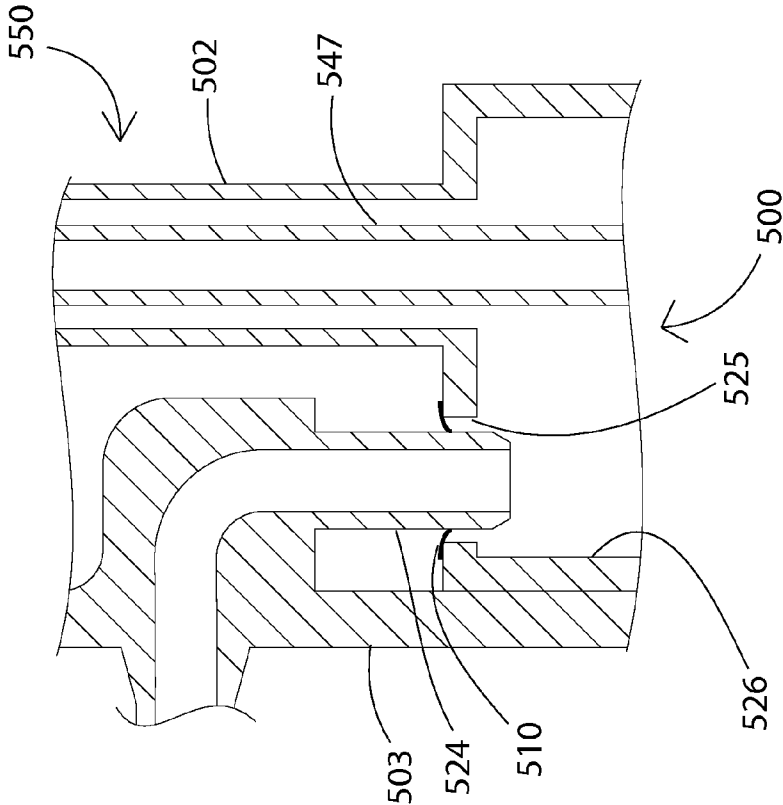
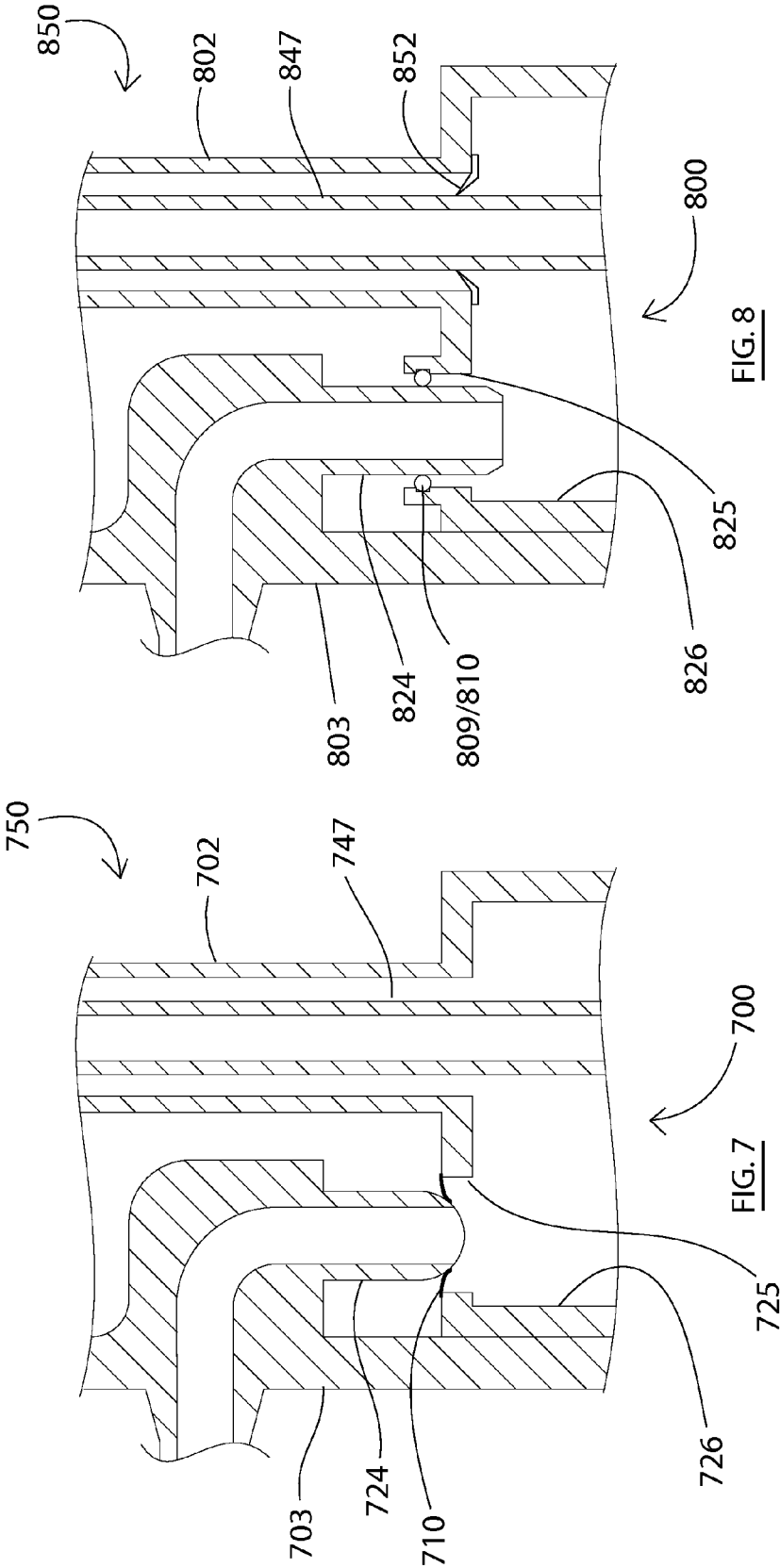
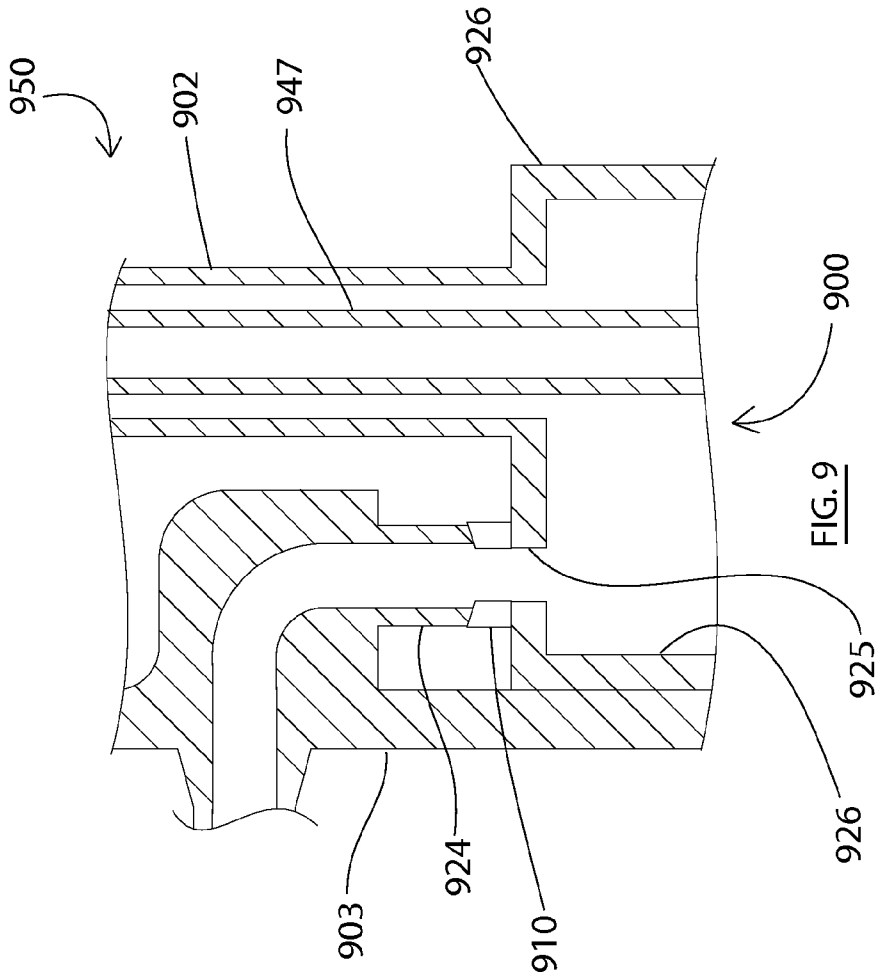


FIG. 5





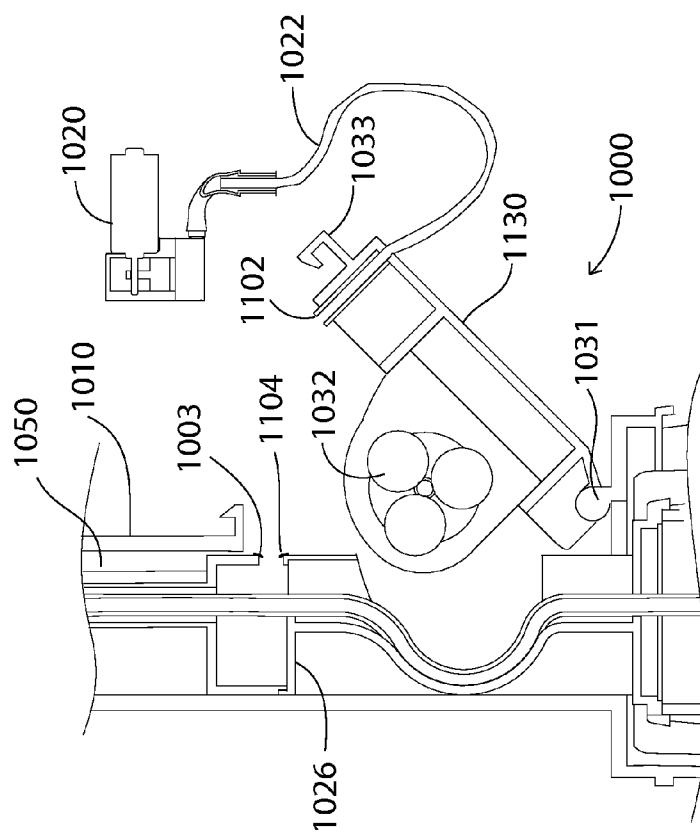


FIG. 11

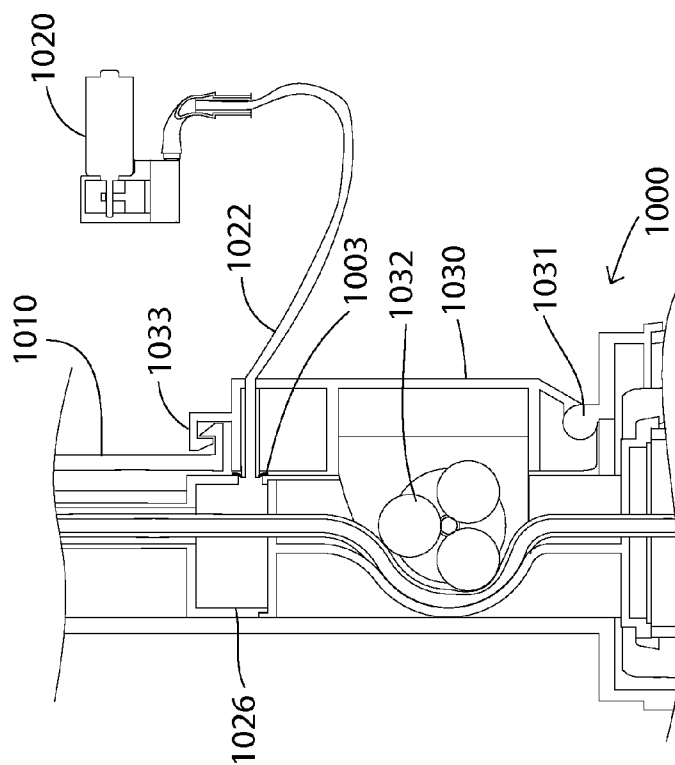


FIG. 10

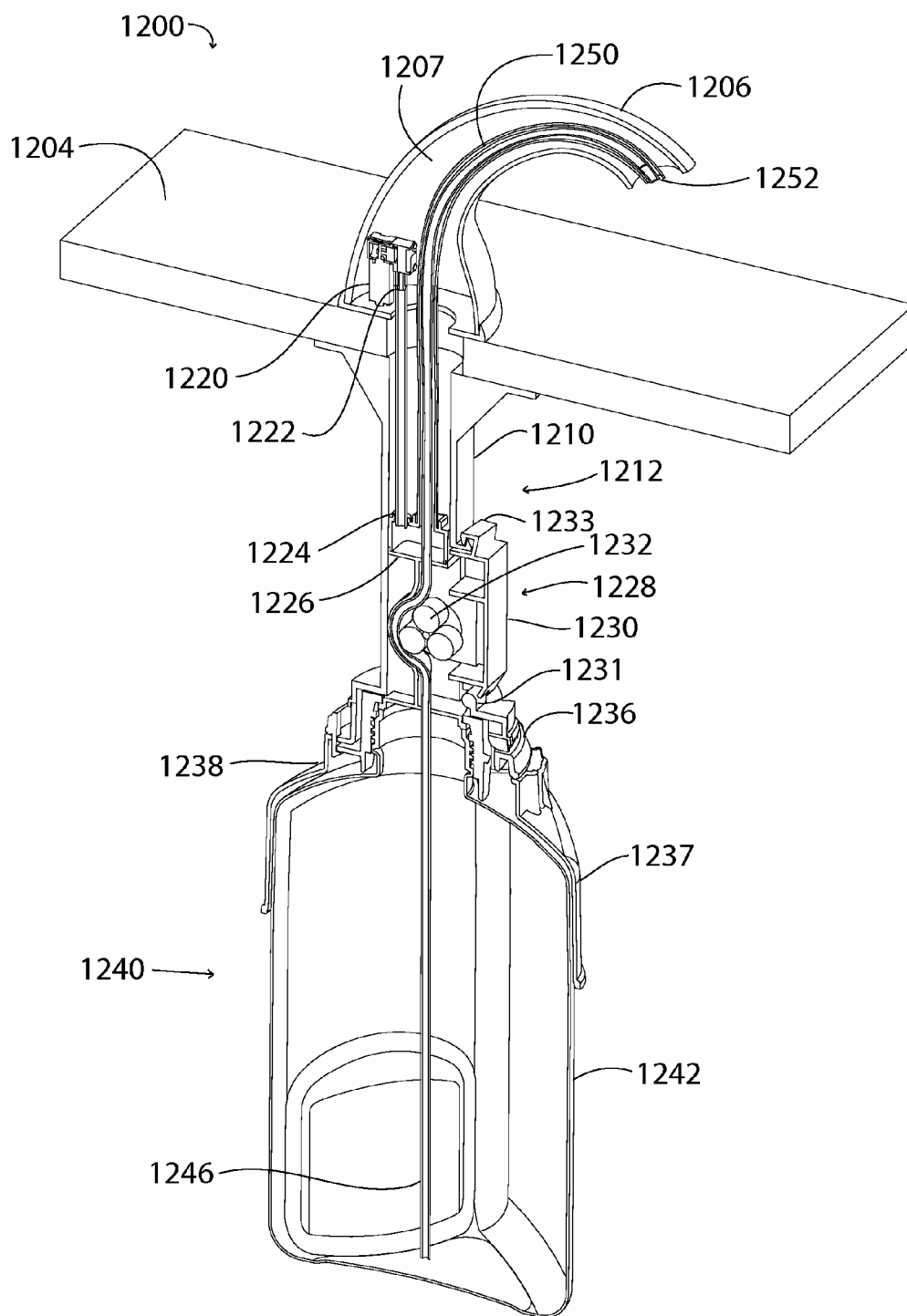


FIG. 12

**UNDER-COUNTER MOUNT FOAM
DISPENSING SYSTEMS WITH PERMANENT
AIR COMPRESSORS AND REFILL UNITS
FOR SAME**

RELATED APPLICATIONS

[0001] This non-provisional utility patent application claims priority to and the benefits of U.S. Provisional Patent Application Ser. No. 61/723,468 filed on Nov. 7, 2012, and entitled UNDER-COUNTER MOUNT FOAM DISPENSING SYSTEMS WITH PERMANENT AIR COMPRESSORS AND REFILL UNITS FOR SAME. This application is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The present invention relates generally to under-counter mount foam dispensing systems, and more particularly to under-counter mount foam dispensing systems with permanently affixed air compressors, and refill units for such foam dispensing systems having an air connection manifold for placing the refill unit in fluid communication with the air compressor.

BACKGROUND OF THE INVENTION

[0003] Liquid dispenser systems, such as liquid soap and sanitizer dispensers, provide a user with a predetermined amount of liquid upon actuation of the dispenser. In addition, it is sometimes desirable to dispense the liquid in the form of foam by, for example, injecting air into the liquid to create a foamy mixture of liquid and air bubbles. Some foam dispensing systems are mounted to a counter top and have a spout on top of the counter and a liquid pump, an air pump and a container that are located under the counter. These types of systems are commonly referred to as under-counter mount dispensing systems. There are two basic types of under-counter mount systems. The first has a refillable container that a user removes, refills with foamable liquid and reinstalls. These types of dispensers are not desirable because bacteria can grow in the container and contaminate the liquid. The second type has a refill unit that includes an air compressor, a liquid pump and a container. When the container is empty, the air compressor, liquid pump and container are removed and thrown away. A new refill unit including the air compressor, liquid pump and container (filled with foamable liquid) is reinstalled. Although these types of refills are more sanitary than refilling the container, these types of refill units are expensive because they contain an air pump and a liquid pump.

SUMMARY

[0004] Under-counter foam dispenser systems and refill units for an under-counter mount foam dispensing system are disclosed herein. An exemplary refill unit includes a container for holding a liquid, at least a portion of a liquid pump, a quick-connect air manifold for releasably connecting to a pressurized air source, an air passage to a mixing chamber and a liquid passage to the mixing chamber. The air inlet is in fluid communication with the source for pressurized air when the refill unit is mounted in the dispensing system and disengages from the pressurized air source when the refill unit is removed from the under-counter mount foam dispensing system.

[0005] Refill units for an under-counter mount foam dispensing system are disclosed herein. Exemplary refill units include a container for holding a liquid, the container adapted to mount below a countertop, and a dip tube that extends to the bottom of the container. The refill units include at least a portion of a liquid pump in fluid communication with the dip tube. A first tube is in fluid communication with the portion of the liquid pump for communicating liquid from the container to a mixing chamber. A manifold is secured to the container. The manifold includes an air inlet and an air outlet. A second tube extends from the air outlet of the manifold to the mixing chamber. The air inlet is engaged with a source of pressurized air when the refill unit is mounted in the foam dispensing system and the air inlet is disengaged from the pressurized air source when the refill unit is not mounted in the dispensing system.

[0006] In addition, methods of installing a refill unit in an under-counter foam dispensing system are disclosed herein. Exemplary methods include obtaining a refill unit that includes a manifold having an air inlet located on the top of the manifold. The method includes aligning the refill unit so that the air inlet is aligned with a source of pressurized air; and moving the refill unit upward to engage the air inlet with the source of pressurized air.

[0007] Foam dispensing systems are also disclosed herein. An exemplary foam dispensing system includes a spout located above a countertop and an air compressor having an air outlet. The system also includes a refill unit having a container for holding a foamable liquid, a liquid outlet tube and a manifold for releasably engaging the air outlet. The system also includes a liquid pump for pumping liquid from the container to through the liquid outlet tube and the liquid pump located below the countertop. In some embodiments, the air compressor is located above the countertop and in some embodiments the air compressor is located below the countertop. Similarly, in some embodiments, the manifold is located above the countertop and in some embodiments the manifold is located below the countertop.

[0008] Another exemplary method of installing a refill unit in an under-counter foam dispensing system includes obtaining a refill unit that includes a manifold having an air inlet located on a side of the manifold and moving the refill unit into position and then connecting an air source to the side of the manifold.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] These and other features and advantages of the present invention will become better understood with regard to the following description and accompanying drawings in which:

[0010] FIG. 1 is a cross-section of an exemplary under-counter mount foam dispenser system 100 with a refill unit 140 installed;

[0011] FIG. 2 is a cross-section of the exemplary under-counter mount foam dispenser 100 system without a refill unit installed;

[0012] FIG. 3 is a cross-section of an exemplary refill unit 140 for use in an under-counter mount foam dispensing system 100;

[0013] FIG. 4 is a cross-section of the exemplary under-counter mount foam dispenser system 100 with a refill unit 140 installed with the liquid pumping mechanism 130 rotated out for removal of the refill unit 140;

[0014] FIG. 5 is a cross-section of an exemplary air connection manifold 500 for use in an under-counter mount foam dispenser system;

[0015] FIG. 6 is a cross-section of another exemplary air connection manifold 600 for use in an under-counter mount foam dispenser system;

[0016] FIG. 7 is a cross-section of another exemplary air connection manifold 700 for use in an under-counter mount foam dispenser system;

[0017] FIG. 8 is a cross-section of another exemplary air connection manifold 800 for use in an under-counter mount foam dispenser system;

[0018] FIG. 9 is a cross-section of yet another exemplary air connection manifold 900 for use in an under-counter mount foam dispenser system;

[0019] FIGS. 10 and 11 illustrate additional cross-sections of another exemplary manifold for connecting an air compressor 1020 to a manifold 1026 of a refill unit of an under-counter foam dispensing system; and

[0020] FIG. 12 is a cross-section of an exemplary under-counter mount foam dispenser system 1200 with a refill unit 1240 installed.

DETAILED DESCRIPTION

[0021] An exemplary embodiment of a foam dispensing system 100 is best described with respect to FIGS. 1-4. FIG. 1 is a cross-section of an exemplary embodiment of a foam dispenser system 100 with a refill unit 140 installed therein. FIG. 2 is a cross-section of the foam dispenser system 100 with refill unit 140 removed. Foam dispenser system 100 includes a spout 106. Spout 106 has a hollow interior 107. Spout 106 is secured to counter 104 by any means such as, for example, a threaded connector (not shown) that extends from spout 106 to below the counter, and the threaded connector is connected to a lower bracket 110. An air pump or air compressor 120 is secured to lower bracket 110 by a mounting member, which is not shown for purposes of clarity. Air compressor 120 is permanently mounted below the counter-top 104 and is not removed with refill unit 140. Air compressor 120 includes an actuator 121 (FIG. 2). Actuator 121 is an electric actuator. Actuator 121 may include a direct current motor and gearing (not shown) that is preferably powered by one or more batteries, but may be powered by other means and may optionally be an alternating current motor and gearing. Optionally, actuator 121 may be a manually-operated actuator.

[0022] Air compressor 120 includes an air tube 122. Air tube 122 terminates at air tube outlet 124 inside the interior of lower bracket 110. Air tube outlet 124 of air tube 122 points in a downward position. Air tube outlet 124 of air tube 122 mates with a manifold 126 when the refill unit 140 is installed in foam dispenser system 100, which is described in detail below with respect to the additional embodiments of exemplary manifolds shown and described with respect to FIGS. 6-11 below.

[0023] In addition, secured to lower bracket 110 is a liquid pump 128. Liquid pump 128 is a peristaltic pump and contains a plurality of rollers 132. Rollers 132 are rotated by a motor (not shown). In one embodiment, a single motor drives the liquid pump 128 and the air compressor 121. The housing of liquid pump 128 is secured to lower bracket 128 by a hinge 131. Liquid pump 128 may be rotated out of the way (see FIG. 4) to insert and remove the refill unit 140 from the under-counter foam dispenser system 100 and rotated back into

place (see FIG. 5) for operation of the foam dispensing system 100. The motor that drives rollers 132 may be powered from the same source as air compressor 120, such as, for example batteries, a 120-VAC source, or the like.

[0024] In addition, although a peristaltic pump is shown in the figures and described in the specification, any type of liquid pump may be used such as, for example, a piston pump, a dome pump, a rotary pump, a diaphragm pump or the like. An aspect of embodiments of the present invention is that all of the parts that contact the liquid are disposed of when the refill unit 140 is replaced. Parts that do not contact the liquid such as, for example, the air compressor 120, air tube 122 and lower bracket 110 may remain secured in position when the refill unit 140 is replaced.

[0025] Lower bracket 110 includes a collar 137. Collar 137 is configured to receive the top portion of container 142. Collar 137 is keyed, or shaped, so that it mates with container 142 in a selected orientation so that the refill unit 140 is properly orientated with lower bracket 110 when refill unit 140 is installed in the foam dispensing system 100. In addition, lower bracket 110 includes a rotatable release ring 136. Rotatable release ring 136 engages with one or more tabs 308 (FIG. 3) on the refill unit 140 when refill unit 140 is inserted in foam dispensing system 100. Rotatable release ring 136 may include a biasing member (not shown), such as a spring, to bias the rotatable release ring 136 into a position that retains refill unit 140 in place. In addition, in one embodiment, rotatable release ring 136 has a cam surface (not shown) so that when refill unit 140 is inserted into foam dispensing system 100, the rotatable release ring 136 rotates automatically and allows the refill unit 140 to move into place. After the tabs 308 of the refill unit 140 move into place, the biasing member moves rotatable release ring 136 into position to secure the refill unit 140. This may be accomplished by, for example, mating tabs (not shown) on rotatable release ring 136.

[0026] FIG. 3 illustrates an exemplary refill unit 140. Refill unit 140 includes a container 142 that forms a liquid reservoir for supply of a foamable liquid within the disposable refill unit 140. In various embodiments, the contained liquid could be for example a soap, a sanitizer, a cleanser, a disinfectant or some other foamable liquid. In the exemplary disposable refill unit 140, the container 142 is a rigid housing member, but can be any type of container having a suitable configuration for containing the foamable liquid without leaking. In other embodiments, the container 142 may be formed by a collapsible container and can be made of thin plastic or a flexible bag-like container.

[0027] Secured to container 142 is a cap 310. Cap 310 includes a plurality of tabs 308 described above for securing the refill unit 140 to the foam dispensing system 100. In addition, a bracket 314 is secured to cap 310. Bracket 314 includes a curved backing plate 316. Bracket 314 and curved backing plate 316 serves to hold liquid tube 146 in place. Curved backing plate 316 is curved with a slightly larger diameter than the outside diameter that rollers 132 travel. When the refill unit 140 is installed in foam dispensing system 100, and the rollers 132 rotate counterclockwise they compress liquid tube 146 against curved backing plate 316 and push liquid up liquid tube 146 toward foaming chamber 152. Foaming chamber 152 is where the liquid and air are combined and pushed through a foaming media, such as, for example, a screen. An exemplary foaming chamber 152 is shown and described in U.S. Pat. No. 7,819,289, entitled

“Foam Soap Generator,” which is incorporated herein by reference. In one embodiment, rollers 132 rotate clockwise for a brief period at the end of a dispense cycle to draw back, or suck back, residual liquid and/or foam to prevent dripping.

[0028] In addition, refill unit 140 includes a quick-connect air manifold 126. Liquid tube 146 extends through a wall 330 of manifold 126. The lower portion of liquid tube 146 is sealed to the wall 330 to prevent leakage. Also secured to manifold 126 is air conduit 150. Air conduit 150 is located coaxial with liquid tube 146. Air conduit 150 terminates proximate foaming chamber 152. An air passage is formed between the inside of air conduit 150 and the outside of liquid tube 149. In addition, quick-connect air manifold 126 includes an inlet aperture 325. Air inlet aperture 325 releasably connects to air tube outlet 124. Air tube outlet 124 preferably has a tapered end, and when refill unit 140 is moved upward, air tube outlet 124 engages air inlet aperture 325. In one embodiment, air tube outlet 124 extends into air inlet aperture 325. The air outlet tube may be tapered and seals against the walls of inlet aperture 325 to form an airtight seal. Optionally, a sealing member may be used to ensure a substantially airtight seal. FIGS. 5 through 11 illustrate a number of exemplary embodiments of quick-connect air manifolds suitable for use in under-counter mount foam dispensing systems.

[0029] FIG. 5 is an enlarged cross-section of an air tube to air manifold connection 500 for an exemplary quick-connect manifold 526 installed in a foam dispensing system. Manifold 526 is similar to manifold 126. Lower bracket 503 may be similar to lower bracket 110 and is secured to the spout (not shown) and provides support for the refill unit. Manifold 526 includes coaxial dispensing tubes 550, which are formed by air conduit 502 and liquid tube 547 arranged coaxially. In this exemplary embodiment, as the refill unit is installed, the coaxial tubes 550 are inserted so that they travel up the interior of the spout (not shown). As the refill unit, including manifold 526, is moved upward into position, air tube end 524 passes through aperture 525 and a sealing member 510 forms a seal between air tube end 524 and manifold 526. The refill unit may be secured in place by, for example, a rotatable engagement ring (not shown), as described above.

[0030] FIG. 6 is an enlarged cross-section of another exemplary embodiment of an air tube to air manifold connection 600 for a quick-connect manifold 626 installed in a foam dispensing system. Manifold 626 is similar to manifold 526. Lower bracket 603 may be similar to lower bracket 503 and is secured to the spout (not shown) and provides support for the refill unit. Manifold 626 includes coaxial dispensing tubes 650, which are formed by air conduit 602 and liquid tube 647 arranged coaxially. In addition, a sealing member 610 is located around aperture 625. Sealing member 610 may be an elastomeric element. In this exemplary embodiment, as manifold 626 is moved upward into position, air tube end 624 contacts and fits around sealing member 610, which is secured to aperture 625. This connection forms a seal between air tube end 624 and manifold 626.

[0031] FIG. 7 is an enlarged cross-section of another exemplary embodiment of an air tube to air manifold connection 700 for a quick-connect manifold 726 installed in a foam dispensing system. Manifold 726 is similar to manifold 626. Lower bracket 703 may be similar to lower bracket 603 and is secured to the spout (not shown) and provides support for the refill unit. Manifold 726 includes coaxial dispensing tubes 750, which is formed by air conduit 702 and liquid tube 747

arranged coaxially and fit within the spout. Air tube end 724 is preferably rounded. Sealing member 710 is located around aperture 725 and may be an elastomeric element. In this exemplary embodiment, as manifold 726 is moved upward into position, air tube end 724 contacts sealing member 710, which is secured to aperture 725. This connection forms a seal between air tube end 724 and manifold 726.

[0032] FIG. 8 is an enlarged cross-section of another exemplary embodiment of an air tube to air manifold connection 800 for a quick-connect manifold 826 installed in a foam dispensing system. Manifold 826 is similar to manifold 526. Lower bracket 803 may be similar to lower bracket 503 and is secured to the spout (not shown) and provides support for the refill unit. Manifold 826 includes coaxial dispensing tubes 850, which is formed by air conduit 802 and liquid tube 847 arranged coaxially and fit within the spout. Manifold 826 includes an annular notch 809 that retains an o-ring 810. In this exemplary embodiment, as manifold 826 is moved upward into position, air tube end passes into aperture 825 and contacts sealing member 810. This connection forms a seal between air tube end 824 and manifold 826.

[0033] In addition, manifold 826 includes a sanitary sealing member 852. Sanitary sealing member 852 is a one-way valve that allows air to flow into the air passage located between liquid tube 847 and air conduit 802. Sanitary sealing member 852 prevents liquid or foam from traveling down the air passage and into manifold 826. Any of the above embodiments, may include a sanitary seal.

[0034] FIG. 9 is an enlarged cross-section of another exemplary embodiment of an air tube to air manifold connection 900 for a quick-connect manifold 926 installed in a foam dispensing system. Manifold 926 is similar to manifold 526. Lower bracket 903 may be similar to lower bracket 503 and is secured to the spout (not shown) and provides support for the refill unit. Manifold 926 includes coaxial dispensing tubes 950, which is formed by air conduit 902 and liquid tube 947 arranged coaxially and may be inserted into the spout. Air tube end 924 has a tapered end. Sealing member 910 projects above and around aperture 925 and may be an elastomeric element. In this exemplary embodiment, as manifold 926 is moved upward into position, air tube end 924 contacts sealing member 910. This connection forms a seal between air tube end 924 and manifold 926.

[0035] FIGS. 10 and 11 are an enlarged cross-section of yet another exemplary embodiment of an air tube to air manifold connection 1000 for a quick-connect manifold 1026 installed in a foam dispensing system. Manifold 1026 is secured to a refill unit. Lower bracket 1010 may be similar to lower bracket 110 and is secured to the spout (not shown) and provides support for the refill unit. Manifold 1026 includes coaxial dispensing tubes 1050, which is formed by an air conduit and liquid tube arranged coaxially. In this exemplary embodiment, air manifold 1026 includes an aperture 1003 located on a side wall. A sealing member 1104 is located around aperture 1003 and may be an elastomeric element. In this exemplary embodiment, the refill unit is removed by unlatching latch 1033 and rotating pumping mechanism 1030 and rollers 1032 outward about hinge 1031. A rotatable release ring (not shown) is rotated, and the refill unit may be removed downward. To install a new refill unit, the coaxial tubes are inserted into the opening and the refill unit is pushed upward. The rotatable release ring rotates out of the way until the tabs (not shown) clear the mating tabs (not shown) and the rotatable release ring rotates back into position to hold the

refill unit in place. The user then rotates the pumping mechanism 1030 back and it is sealed into place by latch 1033. Air tube end 1102 mates with manifold 1026 and the connection is sealed by sealing member 1104. Thus, the new refill unit is installed and the foam dispensing system is ready to operate.

[0036] In some embodiments, a membrane (not shown) is located over the air inlet to the manifold prior to shipping. The membrane prevents contaminants from entering the air manifold prior to installation in a foam dispenser system. In one embodiment, the membrane is pierceable by the end of the air tube. In one embodiment, the membrane is removed prior to installation in a foam dispensing system. In yet another embodiment, air pressure from the pressurized air source ruptures the membrane.

[0037] FIG. 12 is a cross-section of an exemplary embodiment of a foam dispenser system 1200 with a refill unit 1240 installed therein. The dispenser is similar to the dispenser in FIG. 2, which is a cross-section of the foam dispenser system with refill unit removed. Foam dispenser system 1200 includes a spout 1206. Spout 1206 has a hollow interior 1207. Spout 1206 is secured to counter 1204 by any means such as, for example, a threaded connector (not shown) that extends from spout 1206 to below the counter, and the threaded connector is connected to a lower bracket 1210. An air pump or air compressor 1220 is located within spout 1206. Air compressor 1220 is permanently mounted in the spout above the countertop 1204 and is not removed with refill unit 1240. Air compressor 1220 includes an electronic actuator, similar to actuator 121 illustrated in FIG. 2. Optionally, actuator 1221 may be a manually-operated actuator.

[0038] Air compressor 1220 includes an air tube 1222. Air tube 1222 terminates at air tube outlet 1224 inside the interior of lower bracket 1210. Air tube outlet 1224 of air tube 1222 points in a downward position. Air tube outlet 1224 of air tube 1222 mates with a manifold 1226 when the refill unit 1240 is installed in foam dispenser system 1200. Such mating connections are described in detail above with respect to FIG. 1 and FIGS. 6-11.

[0039] In addition, secured to lower bracket 1210 is a liquid pump 1228. Liquid pump 1228 is a peristaltic pump and contains a plurality of rollers 1232. Rollers 1232 are rotated by a motor (not shown). In one embodiment, a single motor drives the liquid pump 1228 and the air compressor 1221. The housing of liquid pump 1228 is secured to lower bracket 1228 by a hinge 1231. Liquid pump 1228 may be rotated out of the way (see e.g. FIG. 4) to insert and remove the refill unit 1240 from the under-counter foam dispenser system 1200 and rotated back into place (see e.g. FIG. 5) for operation of the foam dispensing system 1200. The motor that drives rollers 1232 may be powered from the same source as air compressor 1220, such as, for example batteries, a 120-VAC source, or the like.

[0040] In addition, although a peristaltic pump is shown in the figures and described in the specification, any type of liquid pump may be used such as, for example, a piston pump, a dome pump, a rotary pump, a diaphragm pump or the like. An aspect of embodiments of the present invention is that all of the parts that contact the liquid are disposed of when the refill unit 1240 is replaced. Parts that do not contact the liquid such as, for example, the air compressor 1220, air tube 1222 and lower bracket 1210 may remain secured in position when the refill unit 1240 is replaced.

[0041] Lower bracket 1210 includes a collar 1237. Collar 1237 is configured to receive the top portion of container

1242. Collar 1237 is keyed, or shaped, so that it mates with container 1242 in a selected orientation so that the refill unit 1240 is properly orientated with lower bracket 1210 when refill unit 1240 is installed in the foam dispensing system 1200. In addition, lower bracket 1210 includes a rotatable release ring 1236. Rotatable release ring 1236 engages with one or more tabs 308 (FIG. 3) on the refill unit 1240 when refill unit 1240 is inserted in foam dispensing system 1200. Rotatable release ring 1236 may include a biasing member (not shown), such as a spring, to bias the rotatable release ring 1236 into a position that retains refill unit 1240 in place. In addition, in one embodiment, rotatable release ring 1236 has a cam surface (not shown) so that when refill unit 1240 is inserted into foam dispensing system 1200, the rotatable release ring 1236 rotates automatically and allows the refill unit 1240 to move into place. After the tabs 308 of the refill unit 1240 move into place, the biasing member moves rotatable release ring 1236 into position to secure the refill unit 1240. This may be accomplished by, for example, mating tabs (not shown) on rotatable release ring 1236.

[0042] While the present invention has been illustrated by the description of embodiments thereof and while the embodiments have been described in considerable detail, it is not the intention of the applicants to restrict or in any way limit the scope of the appended claims to such detail. Additional advantages and modifications will readily appear to those skilled in the art. Moreover, elements described with one embodiment may be readily adapted for use with other embodiments. Therefore, the invention, in its broader aspects, is not limited to the specific details, the representative apparatus and illustrative examples shown and described. Accordingly, departures may be made from such details without departing from the spirit or scope of the applicants' general inventive concept.

We claim:

1. A refill unit for an under-counter mount foam dispensing system comprising:

- a container for holding a liquid, the container adapted to mount below a countertop;
- a dip tube extending to the bottom of the container;
- at least a portion of a liquid pump in fluid communication with the dip tube;
- a first tube having a proximate end and a distal end;
- a mixing chamber for receiving air and liquid;
- the proximate end of the first tube in fluid communication with the portion of the liquid pump and configured to be below the top of a counter when installed in a foam dispensing system and the distal end in fluid communication with the mixing chamber;
- the mixing chamber configured to be located above the counter when installed in a foam dispensing system;
- a manifold secured to the container;
- the manifold comprising an air inlet and an air outlet,
- a second tube extending from the air outlet to the mixing chamber for communicating air from the manifold to the mixing chamber;
- the air inlet being in fluid communication with a source for pressurized air when the refill unit is mounted in the dispensing system and being disengaged from the pressurized air source when the refill unit is removed from the under-counter mount foam dispensing system.

2. The refill unit of claim 1 wherein the air inlet is located on a top portion of the manifold.

3. The refill unit of claim 1 further comprising a sealing member located around the air inlet to create a seal between the air inlet and the source of pressurized air when the refill unit is installed in the foam dispensing system.

4. The refill unit of claim 1 further comprising an alignment member configured to cause the air inlet on the manifold to line up with the source of pressurized air when the refill unit is installed in the foam dispensing system.

5. The refill unit of claim 1 wherein the at least a portion of the liquid pump comprises a collapsible tube.

6. The refill unit of claim 1 wherein the at least a portion of the liquid pump comprises a dome pump.

7. The refill unit of claim 1 further comprising a membrane located over the air inlet on the air inlet to the manifold, wherein the membrane is removable prior to installing in the foam dispensing system or is pierceable by the source for pressurized air.

8. A refill unit for an under-counter mount foam dispensing system comprising:

a container for holding a liquid, the container adapted to mount below a countertop;

a dip tube extending to the bottom of the container;

at least a portion of a liquid pump in fluid communication with the dip tube;

a first tube in fluid communication with the portion of the liquid pump for communicating liquid from the container to a mixing chamber,

a manifold secured to the container;

the manifold comprising an air inlet and an air outlet;

a second tube extending from the air outlet of the manifold to the mixing chamber;

the air inlet being engaged with a source of pressurized air when mounted in the foam dispensing system and being disengaged from the pressurized air source when the refill unit is not mounted in the dispensing system.

9. The refill unit of claim 8 further comprising a tube from the mixing chamber to an outlet.

10. The refill unit of claim 8 wherein the air inlet is located on a top portion of the manifold.

11. The refill unit of claim 8 further comprising a sealing member located around the air inlet which creates a seal between the air inlet and the source of pressurized air when the refill unit is installed in the foam dispensing system.

12. The refill unit of claim 8 further comprising an alignment member configured to cause the air inlet on the manifold to line up with the source of pressurized air when the refill unit is installed in the foam dispensing system.

13. The refill unit of claim 8 wherein the at least a portion of the liquid pump comprises a collapsible tube.

14. The refill unit of claim 8 wherein the at least a portion of the liquid pump comprises a piston pump.

15. The refill unit of claim 8 wherein the at least a portion of the liquid pump comprises a dome pump.

16. The refill unit of claim 8 further comprising a membrane located over the air inlet on the air inlet to the manifold for shipping.

17. A foam dispensing system comprising;

a spout located above a countertop;

an air compressor having an air outlet;

a refill unit having a container for holding a foamable liquid; a liquid outlet tube and a manifold for releasably engaging the air outlet;

a liquid pump for pumping liquid from the container to through the liquid outlet tube; and

the liquid pump located below the counter top.

18. The foam dispensing system of claim 17 wherein the air compressor is located below the counter.

19. The foam dispensing system of claim 17 wherein the air compressor is located above the counter and within the spout.

20. The foam dispensing system of claim 17 wherein the manifold is located below the counter.

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