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(54) Title: FOAM DISPENSERS AND REFILL UNITS FOR FOAM DISPENSERS

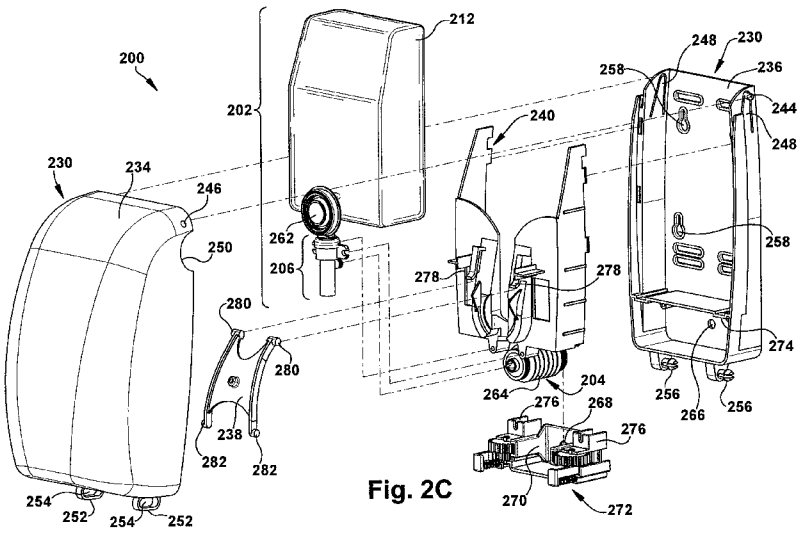

Fig. 2C

(57) Abstract: A refill unit for a foam dispenser that has an air compressor permanently attached to the dispenser is provided herein. The refill unit includes a liquid container and a body portion having a first end and a second end. The first end of the body portion is fluidly coupled to the liquid container. A liquid chamber is located in the pump body, the liquid chamber having an expanded state and a contracted state. An outlet nozzle is located proximate a second end of the body portion. A mixing chamber is located within the body portion. An air inlet is located through the body portion and is in fluid communication with the mixing chamber. A sanitary seal is located proximate the air inlet. The sanitary seal allows air to enter into the mixing chamber and prevents liquid from traveling out of the body portion through the air inlet.

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CLAIMS

We claim:

1. A refill unit (102, 202, 901, 1101) for a foam dispenser that has an air compressor (104, 204, 910, 1102) permanently attached to the dispenser, comprising:

a liquid container (112, 212, 920) for holding liquid material;

a body portion having a first end and a second end, the first end of the body portion (302, 926, 1101) fluidly coupled to the liquid container (112, 212, 920);

a resilient member (312, 932) secured to the body portion;

a liquid chamber (925) formed at least partially by the resilient member (312, 932), the liquid chamber (925) having a first expanded state and a second contracted state;

an outlet nozzle (308, 958, 1120) located proximate the second end of the body portion;

a mixing chamber (106, 314, 952) located within the body portion in fluid communication with the liquid chamber (925);

an air inlet (150, 360, 935, 1104) located through a wall of the body portion in fluid communication with the mixing chamber (925);

the air inlet (150, 360, 935, 1104) configured to releasably connect to an air compressor that is permanently attached to a dispenser;

a sanitary seal (151, 322, 934, 1113) formed at least in part by the resilient member (312, 932) located proximate the air inlet (150, 360, 935, 1104);

the air inlet (150, 360, 935, 1104) opens to the atmosphere prior to being installed in a dispenser;

wherein the sanitary seal (151, 322, 934, 1113) allows air into the mixing chamber and prevents liquid from traveling out of the body portion through the air inlet (150, 360, 935, 1104).

2. The refill unit of claim 1 wherein the resilient member (932) that also forms a dome.

3. The refill unit of claim 1 wherein the sanitary seal (322, 1113) is a located within the interior of the pump body.

4. The refill unit of claim 3 wherein the sanitary seal (1113) is a cup shaped member.

5. The refill unit of claim 1 wherein the air inlet (150, 360, 935) is cylindrical.

6. The refill unit of claim 1 wherein the air inlet (1104) is funnel shaped.

7. A dispenser comprising the refill unit of claim 1 further comprising a dispenser (100, 200, 900, 1100).

8. The dispenser of claim 7 wherein the dispenser comprises an air compressor (104, 204, 910, 1102) secured thereto.

9. The dispenser of claim 8 wherein the air compressor (104, 204, 910, 1102) is secured to a lid (904) of the dispenser (900, 1100).

10. The dispenser of claim 8 further comprising an adjustable actuator (310, 1117) so that can be adjusted to adjust the volume of fluid moved by compressing the liquid chamber.

11. A foam dispenser for dispensing foam, comprising:

a housing (230, 902);

an air compressor (104, 204, 910, 1102) permanently secured to the housing (230, 902);

the air compressor (104, 204, 910, 1102) attached to a lid (234, 904) of the dispenser and being compressible along a substantially horizontal axis;

an air outlet (327) in fluid communication with the air compressor (104, 204, 910, 1102);

the air outlet in fluid communication with the atmosphere when there is no refill unit installed in the dispenser;

a nozzle (327, 1104) connected to the air outlet, the nozzle (327, 1104) configured to releasably mate with a manifold that is part of a refill unit;

a liquid pump activating member (310, 908, 1117) that moves a portion of a liquid pump (262, 924, 1102) to pump a liquid; and

an adjustable actuator (310, 1117) to adjust the volume of fluid dispensed.

12. The foam dispenser of claim 11 wherein the air compressor (104, 204, 910, 1102)comprises a bellows.

AMENDED SHEET (ARTICLE 19)

13.

14. The foam dispenser of claim 12, further comprising a sealing member (331, 1108) secured to the nozzle, for providing an air tight seal with a refill unit (102, 202, 901, 1101).

15. A foam dispenser comprising:

a housing (230, 902);

an air compressor (104, 204, 910, 1102) permanently secured to the housing (230, 902);

the air compressor (104, 204, 910, 1102) being compressible along a substantially horizontal axis;

the air compressor (104, 204, 910, 1102) comprising an outlet nozzle (327, 1104), the outlet nozzle (327, 1104), in fluid communication with the atmosphere;

a sealing member 1108 for sealing the nozzle to a manifold of a refill unit, wherein the nozzle (327, 1104), is releasably sealed to a manifold of a refill unit forming an airtight seal with the manifold when the refill unit is installed in the foam dispenser; ~~and~~

a liquid pump (310, 908, 1117) activating member that moves a portion of a liquid pump (262, 924, 1102) to pump and

an adjustable actuator (310, 1117) that may be adjusted to adjust the volume of liquid dispensed by the dispenser during actuation.

16. The foam dispenser of claim 15 further comprising a refill unit (102, 202, 901, 1101) comprising a manifold having an air inlet (360, 935,).

17.

18. The foam dispenser of claim 16 wherein the refill unit (102, 202, 901, 1101) comprises a sanitary seal (151, 306, 934, 1113), wherein the sanitary seal (151, 306, 934, 1113) allows air to enter the manifold air inlet and prevents liquid from exiting the manifold through the air inlet.

19. The foam dispenser of claim 16 comprising a liquid pump chamber formed at least in part by a resilient member (312, 932).

AMENDED SHEET (ARTICLE 19)

20. The foam dispenser of claim 19 further comprising a sanitary seal (934) formed at least in part by the resilient member (932).