(19) DANMARK

(10) DK/EP 2328690 T3

(12) Oversættelse af europæisk patentskrift

Patent- og Varemærkestyrelsen

(51) Int.Cl.: *B 05 B 11/00 (2006.01)* *A 47 K 5/12 (2006.01)* *A 47 K 5/14 (2006.01)*

(45) Oversættelsen bekendtgjort den: **2015-03-30**

(80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2015-01-14**

(86) Europæisk ansøgning nr.: **09792459.1**

(86) Europæisk indleveringsdag: **2009-09-11**

(87) Den europæiske ansøgnings publiceringsdag: **2011-06-08**

(86) International ansøgning nr.: **US2009056648**

(87) Internationalt publikationsnr.: **WO2010030870**

(30) Prioritet: **2008-09-11 US 191739 P**

(84) Designerede stater: **AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR**

(73) Patenthaver: **Gojo Industries, Inc., One Gojo Plaza , Suite 500 , P.O. Box 991, Akron, OH 44309, USA**

(72) Opfinder: **Nick, Ciavarella, 921 Juston Lane, Seven Hills, Ohio 44131, USA**
David, Hayes, 2641 Melrose Drive, Wooster, Ohio 44691, USA
Joseph, Crowe, 21970 Russet Drive, Meadville, Pennsylvania 16335, USA
Robert, Quinlan, 3466 Charring Cross Drive, Wooster, Ohio 44224, USA

(74) Fuldmægtig i Danmark: **PATRADE A/S, Fredens Torv 3A, 8000 Århus C, Danmark**

(54) Benævnelse: **Pumpe med en fleksibel mekanisme til indgreb med en dispenser**

(56) Fremdragne publikationer:
EP-A2- 2 005 871
US-A- 5 431 309
US-A- 5 918 568
US-B1- 7 201 295

FIELD OF THE INVENTION

[0001] The invention herein relates to a refill unit for a use in a product dispensing system and a product dispensing system with such a refill unit.

BACKGROUND OF THE INVENTION

[0002] It is well known in the art of foam pumps to provide a refill unit that is inserted into a foam product dispenser housing. The refill unit includes a product reservoir and a pump and is placed in the dispenser housing to create a product dispenser. Part of the dispenser housing, often the cover, pivots to expose an internal cavity defined by the housing and to allow the refill unit to be removed, when the product reservoir is empty, and replaced with a refill unit having a (preferably) full product reservoir. Thus, the dispenser housing can be refilled with product without requiring replacement of the entire dispenser. Typically, the dispenser includes an actuating mechanism that connects to, or is someway engaged, with the pump when the refill unit is received therein. The actuating mechanism of the dispenser may be a push bar, or may involve pivoting of the dispenser cover. A liquid pump dispenser of this type is disclosed in US 7 201 295 B1.

[0003] Notably, it is often difficult to insert the refill unit into the dispenser. Often times the engagement between the pump and the actuating mechanism of the dispenser housing is complicated and requires accurate alignment of the pump and refill unit to properly be received by the dispenser housing. This can result in difficulty and, at times, frustration on the part of the person installing the refill unit. In addition, if inserted improperly and with too much force, the engagement mechanism or the dispenser may become broken, or the refill unit may be actuated, resulting in dispensing of foam within the dispenser. For permitting simplified insertion and replacement of the refill unit US 5 431 309 A discloses a liquid soap dispenser according to the preamble of claim 1.

[0004] Another problem commonly associated with foam product dispensers results when a user presses too forcefully on the actuating mechanism. The high force applied to the actuating mechanism of the dispenser is transferred to the pump, resulting in shearing of the foam product, which causes poor quality foam to be dispensed that has a greater than desired liquid content. US 5 918 568 dis-

closes a locking member for dispensers used for the purpose of preventing inadvertent dispensing during shipping.

[0005] Thus, the need exists for an improved mechanism on a foam pump for engaging the actuating mechanism of the dispenser, making installation of the pump easier, while also providing a dampening function to prevent foam shearing.

SUMMARY OF THE INVENTION

[0006] In light of the foregoing, it is a first aspect of the present invention to provide a refill unit for a product dispenser that is easy to install in the dispenser.

[0007] It is another aspect of the present invention to provide a refill unit, as above, that includes a connecting member extending from a foam pump, the connecting member having a flexible tip.

[0008] It is still another aspect of the present invention to provide a refill unit, as above, that includes a locking sleeve positioned on the connecting member to prevent unwanted actuating of the pump during shipping and installation.

[0009] In general, a refill unit according to the present invention includes a product reservoir and a pump in fluid communication with the product reservoir. The pump includes a flexible connecting member that is received by the actuating carriage of the dispenser and that is provided in the form of a flared tip extending from the pump. The flexible connecting member is not provided in the form of a plurality of finger members (as is disclosed in post-published EP 2 005 871 A2).

[0010] The pump may be a piston pump having a reciprocating piston.

[0011] A locking member may be provided that prevents unintended actuation of the pump.

[0012] The pump may include a pump housing having a generally oval shaped opening therein through which the piston extends.

[0013] In accordance with at least one aspect of the present invention, a product dispensing system includes a dispenser housing defining an internal cavity and having an actuating device pivotally connected thereto, an actuating carriage dis-

posed within the internal cavity of the housing and movingly engaged with the actuating device, and a refill unit in accordance with the above mentioned aspects. Movement of the actuating carriage caused by movement of the actuating device is transferred to the pump by the flexible connecting member.

[0014] A lock ring may be provided within the internal cavity, the lock ring having a bottom surface and an opening positioned substantially concentrically in the bottom surface, wherein the lock ring receives the pump therein.

[0015] The bottom surface of the lock ring may be funnel shaped, sloping toward the opening.

[0016] The opening in the lock ring may be generally oval shaped, and the flexible connecting member may be generally conical in shape.

[0017] The oval opening in the lock ring may have a length and a width, the length being larger than the width, and the connecting member may have a diameter approximately equal to but slightly larger than the width of the oval opening.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] For a full understanding of the invention reference should be made to the following detailed description and the accompanying drawings, wherein:

Fig. 1 is a front elevational view of a foam product dispenser according to the concepts of the present invention.

Fig. 2 is a side elevational view of the foam product dispenser of Fig. 1.

Fig. 3 is a front elevational view of the refill unit according to the concepts of the present invention showing the locking sleeve in a pre-loaded position.

Fig. 4 is a top elevational view of the refill unit showing the oval-shaped opening in the pump.

Fig. 4A is a front elevational view of the refill unit of Fig. 4 showing the pump in a loaded position.

Fig. 5 is a section view of the dispenser taken generally across line 6-6 of Fig. 2 showing the actuating carriage and pump in an unactuated position.

Fig. 6 is a section view as depicted in Fig. 6 showing the actuating carriage and pump in an actuated position.

DETAILED DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENTS

[0019] Referring now to Figs. 1 and 2, a conventional product dispenser is shown and is generally indicated by the numeral 10. Dispenser 10 includes a housing 11 including a push bar 12, a back plate 13 (Fig. 2) and a pivoting cover 14. As is well known in the art, cover 14 pivots on back plate 13 to provide access to an internal cavity for refilling the dispenser. While a particular housing configuration for providing access to the internal cavity is contemplated and described herein, it should be appreciated that any such mechanism known to those skilled in the art may be employed. Push bar 12 is pressed by a user to actuate the foam pump within dispenser 10, and is biased to return to its non-actuated state after use. A window 15 may optionally be provided in cover 14 to allow visual inspection of the fluid level within the liquid reservoir in the dispenser 10.

[0020] Figs. 3-4A depict a refill unit 20 that is to be inserted into housing 11 of dispenser 10. Refill unit 20 includes a product reservoir 22 that contains a product to be dispensed, such as, for example, liquid soap or hand sanitizer. The contents of product reservoir 22 are in fluid communication with a piston pump 24 as is well known in the art. Various types of piston pumps are well known, and this invention is not limited to or by any particular piston pump structure. The structure and operation of piston pump 24 can take various forms not germane to the invention, and therefore will not be described in great detail. A piston pump functions by expelling a product from the pump when a piston is pressed into a pump housing, causing the volume of an internal cavity to decrease forcing the contents therein toward an outlet. The piston is biased to an unactuated position such that, when it is released the volume of the an internal cavity to decrease forcing the contents therein toward an outlet. The piston is biased to an unactuated position such that, when it is released the volume of the internal cavity increases and creates a vacuum to draw product from the product reservoir into the internal cavity. Although a piston pump 24 having a piston 26 and pump housing 27 is shown and described herein, it is contemplated that dispenser 10 may be adapted to accommodate other types of liquid or foam pumps that are known to those skilled in the art.

[0021] Pump 24 includes a flexible connecting member for engagement with an actuating mechanism within dispenser 10. The flexible connecting member extends from piston 26 in a direction opposite product reservoir 22. The flexible

connecting member facilitates easy insertion of refill unit 20 and may, in some instances, act to dampen forces transmitted by the actuating mechanism and thereby reduce foam shearing in the case of a foam pump. The flexible connecting member may be provided in the form of a flexible tip 28 associated with an end of piston 26. Flexible tip 28 may be formed integrally with piston 26, or alternatively flexible tip 28 may extend from a sleeve that is secured to and around piston 26. Flexible tip 28 is adapted to transfer actuating forces from pushbar 12 to piston 26 and pump 24, as will be discussed in greater detail below.

[0022] Flexible tip 28 may be provided in any desired size and shape without deviating from the scope of the present invention, so long as flexible tip 28 is at least minimally flexible and resilient so that it can undergo at least some deformation and then return to its original state. In order to provide the required minimal flexibility, tip 28 may be made from an elastomeric material. In one or more embodiments, flexible tip 28 may have a hardness of between approximately 30-70 as measured on a Shore A durometer scale. In the embodiment of the invention depicted in Figs. 3-6, flexible tip 28 is in the form of a flared tip having a generally conical shape extending from the end of the generally cylindrical piston 26.

[0023] In one or more embodiments, a locking sleeve 30 may be provided around piston 26. Locking sleeve 30 is generally annular in shape and includes axially opposing flanges 32 and 34 extending radially outward. A first flange 32 is positioned opposite flexible tip 28, and a second flange 34 is positioned on a side of locking sleeve 30 facing flexible tip 28. First flange 32 has an outer diameter that is larger than second flange 34. Locking sleeve 30 is restrained from axial movement on piston 26 in one direction by an outwardly extending annular rib 36 on the outer surface of piston 26. Thus, as shown in Fig. 3, locking sleeve 30 is positioned between annular rib 36 and an outer surface of pump housing 27.

[0024] Pump housing 27 includes an opening 40 (Figs. 4A-6) through which a portion of piston 26 extends. Opening 40 is provided adjacent to first flange 32 of lock sleeve 30. As shown in Fig. 3, first flange 32 partially engages pump housing 27 around opening 40 to prevent movement of piston 26 relative to pump housing 27. In this way unintended actuation of pump 24 is prevented during storage, shipping, and insertion of refill unit 20 into housing 11. Opening 40 is provided in a shape that is different from the annular shape of first flange 32 such that contact is made only at several points. Opening 40 and first flange 32 are sized so

that unintended and presumably low-force movement of piston 26 is prevented, but that the resistance of the engagement of first flange 32 can be overcome when refill unit 20 has been inserted into housing 11 and actuation of pump 24 is desired. Thus, once refill unit 20 has been properly installed within housing 11 of dispenser 10, a user must exert a higher than usual force on the first actuation of pump 24 through pushbar 12 in order to cause first flange 32 to move past and into opening 40, as depicted in Fig. 4A. Both first flange 32 and pump housing 27 are flexible and resilient to a sufficient extent to allow movement of locking sleeve 30 through opening 40 and into pump housing 27 when a great enough force is applied.

[0025] As shown in Fig. 4, opening 40 may be provided in the shape of an oval having a length L that is larger than its width W. The width of oval-shaped opening 40 is slightly smaller than the diameter D of first flange 32. However, the length of oval-shaped opening 40 is larger than the diameter D of first flange 32. Thus, first flange 32 of locking sleeve 30 engages pump housing 27 adjacent to oval-shaped opening 40 only at the sides adjacent the narrow width of the opening. The resistance provided by first flange 32 is easily overcome by a person actuating pump 24 for the first time. Second flange 34 is smaller in diameter than first flange 32, and is smaller than both W and L of oval opening 40, and therefore does not provide additional resistance against movement of piston 26.

[0026] With reference now to Figs. 5 and 6, refill unit 20 is shown inserted into housing 11 of dispenser 10. A lock ring 46 is provided near the bottom end of the internal cavity within dispenser 10. Lock ring 46 is adapted to receive and secure pump 24 of refill unit 20 therein. Lock ring 46 includes an opening 48 positioned substantially at its center, with the bottom surface of lock ring 46 being funnel shaped and sloping towards opening 48. Opening 48 is generally oval-shaped and, like opening 40, has a length that is larger than its width. The width of opening 48 is slightly smaller than the largest diameter of generally conically shaped flexible tip 28. Thus, under pressure during insertion, flexible tip 28 deforms slightly to fit through opening 48. The deformation of flexible tip 28 as it passes through opening 48 is assisted by the funnel shape of the bottom surface of lock ring 46.

[0027] Once flexible tip 28 has passed through opening 48 in lock ring 46 it resumes its original generally conical shape and is received between a pair of circular ribs 49 on an actuating carriage 50. Actuating carriage 50 is movingly engaged

with pushbar 12, or any other actuating mechanism known in the art, such that actuation causes movement of actuating carriage 50. Any system or mechanism known in the art may be employed to transfer motion from the actuator, in this case pushbar 12, to actuating carriage 50, such as, for example, a cam mechanism. As will be appreciated by those skilled in the art, the funnel shaped bottom surface of lock ring 46 and the flexible connecting member of pump 24, in this case flexible tip 28, allows for insertion of refill unit 20 in housing 11 without requiring precise alignment of the components.

[0028] Fig. 5 depicts the refill unit 20 positioned within housing 11 in a locked state, with locking sleeve 30 positioned between annular rib 36 and pump housing 27. When actuating carriage 50 is caused to move upward upon the first actuation of pump 24, first flange 32 of locking sleeve 30 is forced through oval-shaped opening 40 in pump housing 27, thereby allowing movement of piston 26 relative to piston housing 27. Fig. 6 shows locking sleeve 30 in a post-actuation position within pump housing 27. After the first actuation of pump 24, locking sleeve 30 no longer inhibits movement of piston 26 because first flange 32 is no longer engaged with pump housing 27 to prevent actuating movement of piston 26. It should be appreciated that other locking mechanisms may be employed to prevent unintended and unwanted actuation of pump 24 during storage, transport and installation. For example, a weak thermoplastic weld may be provided between piston 26 and piston housing 27 during manufacturing of pump 24, the weak weld being overcome by the initial actuation of pump 24 in a manner similar to what is described above.

[0029] As will be appreciated by those skilled in the art, the above embodiment includes a flexible connecting member that allows a pump to be positioned within a dispenser housing by virtue, at least in part, of its ability to deform. The flexible member provides a connection between the pump and an actuating carriage to transfer an input force to the pump, thereby generating foam. The deformable and resilient nature of the flexible member provides a dampening function if an actuating member, such as push bar 12, is actuated with too much force. As will also be appreciated, the embodiment provides a reliable structure for facilitating proper mounting of a refill unit in a dispenser housing.

[0030] It is thus evident that a product dispenser constructed as described herein accomplishes the objects of the present invention and otherwise substantially improves the art.

[0031] feet 116. Due to the radiused surface on flexible feet 116, they are forced outwardly when engaged by pump 112. When folded out, flexible feet 116 are received in a pair of circular ribs 124 on an actuating carriage 126, thereby connecting the carriage to the pump to allow for actuation of the pump. Fig. 7 shows pump 112 in a partially inserted state, prior to engagement of flexible feet 116. Fig. 8 depicts pump 112 in a fully inserted state, with flexible feet 116 received in circular ribs 124.

[0032] With reference now to Fig. 9, a third embodiment of the flexible mechanism for connecting a foam pump into the dispenser is shown. Similar to the second embodiment discussed above, the third embodiment of the flexible connecting member may be substituted in the refill unit 20 shown in Figs. 3-6. In the third embodiment, a dispenser coupler 210, that is generally cylindrical in shape, is positioned around the lower end of a pump 212. A plurality of elongated flexible extensions 214, also referred to as flexible fingers 214, are connected to a lower end of pump 212 and project through an opening in the lower end of dispenser coupler 210. Flexible fingers 214 naturally arch outward away from each other as they extend away from pump 212.

[0033] A cylindrical collar 216 is provided around flexible fingers 214, such that when it is positioned at an extreme end of fingers 214, they are restricted from arching outward. Conversely, when cylindrical collar 216 is positioned adjacent to dispenser coupler 210, flexible fingers 214 are permitted to arch as molded. Prior to insertion into a dispenser, collar 216 is positioned at the extreme end of flexible fingers 214 to restrict their outward arching and to facilitate insertion. As flexible fingers 214 and collar 216 are inserted into a housing, the fingers and collar pass through an opening in the bottom of a lock ring at the bottom of the dispenser as in the second embodiment discussed above. An outwardly extending flange 218 of collar 216 catches on the lock ring around the opening so that the cylindrical body of collar 216 remains in the opening of the lock collar. The flexible fingers 214 then slide through the lock collar 216 and extend through the opening while returning to their naturally outward arching positions. As fingers 214 return to their natural shape, they are received between two circular ribs 222 on an actuating carriage 220.

[0034] As will be appreciated by those skilled in the art, each of the above embodiments includes flexible connecting members that allow a pump to be positioned within a dispenser housing by virtue, at least in part, of their ability to de-

form. The flexible members provide a connection between the pump and an actuating carriage to transfer an input force to the pump, thereby generating foam. The deformable and resilient nature of the flexible members provide a dampening function if an actuating member, such as push bar 12, is actuated with too much force. As will also be appreciated, each embodiment provides a reliable structure for facilitating proper mounting of a refill unit in a dispenser housing.

[0035] It is thus evident that a product dispenser constructed as described herein accomplishes the objects of the present invention and otherwise substantially improves the art.

Patentkrav

1. Efterfyldningsenhed (20) til brug i et produktudleveringssystem (10), omfattende et dispenserhus (11) med en drivindretning (12), som går i indgreb med en betjeningsvogn (50), hvilken efterfyldningsenhed omfatter:
- et produktreservoir (22), og
- en pumpe (24) i fluidforbindelse med produktreservoiret (22), hvilken pumpe (24) omfatter et fleksibelt forbindelseselement, som optages af og er forbundet med betjeningsvognen (50),
kendetegnet ved, at det fleksible forbindelseselement er tilvejebragt i form af en udspilet spids (28), der strækker sig fra pumpen (24), og ikke i form af en flerhed af fingerelementer.

2. Efterfyldningsenhed ifølge krav 1, hvori pumpen (24) er en stempelpumpe med et frem- og tilbagegående stempel (26).

3. Efterfyldningsenhed ifølge krav 2, hvori det fleksible forbindelseselement strækker sig fra en ende af stemplet (26).

4. Efterfyldningsenhed ifølge krav 2, yderligere omfattende et låseelement (30), som hindrer utilsigtet aktivering af pumpen (24).

5. Efterfyldningsenhed ifølge krav 4, hvori låseelementet (30) er en manchet placeret omkring stemplet (26), hvilken manchet omfatter en første ringformet flange (32), der vender mod pumpen (24), og en anden ringformet flange (34) modsat den første ringformede flange (32).

6. Produktudleveringssystem (10) omfattende:
- et dispenserhus (11), som definerer et indvendigt hulrum og med en drivindretning (12) svingbart forbundet dermed,
- en betjeningsvogn (50) placeret inde i dispenserhusets (11) indvendige hulrum og i bevægeligt indgreb med aktiveringsindretningen (12),
- en efterfyldningsenhed ifølge ethvert af krav 1 til 5,
- hvori betjeningsvognens (50) bevægelse forårsaget af drivindretningens bevægelse overføres til pumpen (24) med det fleksible forbindelseselement.

7. Produktudleveringssystem ifølge krav 6, yderligere omfattende:

- en låsering (46) placeret inde i det indvendige hulrum, hvilken låsering (46) har en bundflade og en åbning (48) placeret i det væsentlige koncentrisk i bundfladen, hvori låseringen (46) optager pumpen (24) deri.

8. Produktudleveringssystem ifølge krav 7, hvori bundfladen er tragtformet og skråner nedad mod åbningen (48).

9. Produktudleveringssystem ifølge krav 7, hvori åbningen (48) i låseringen (46) er generelt ovalt udformet, og hvori det fleksible forbindelseselement har hovedsagelig konisk form.

10. Produktudleveringssystem ifølge krav 9, hvori den ovale åbning (48) i låseringen (46) har en længde og en bredde, hvilken længde er større end bredden, og hvori forbindelseselementet har en diameter omtrent lig med, men lidt større end bredden af den ovale åbning (48).

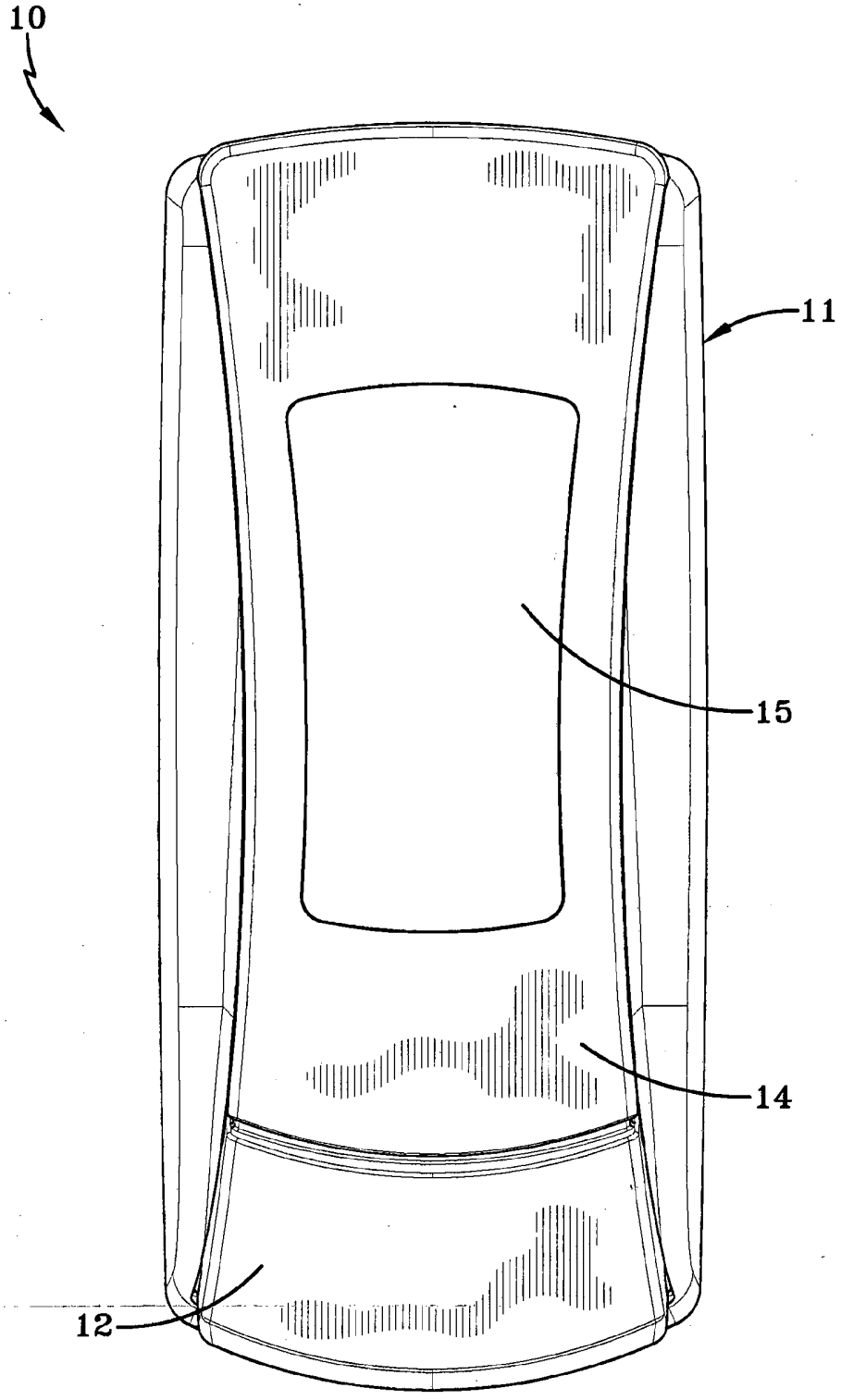


FIG-1

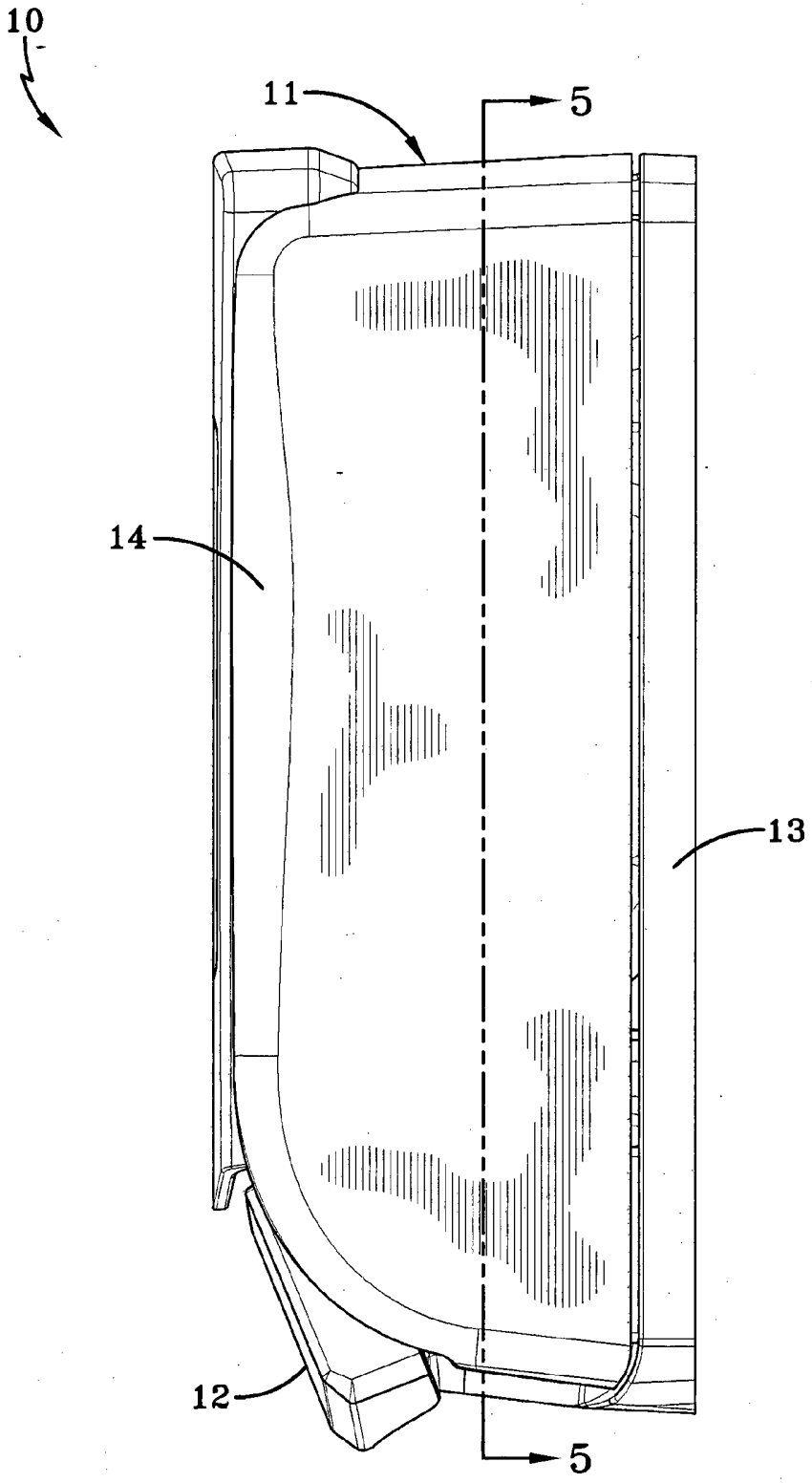


FIG-2

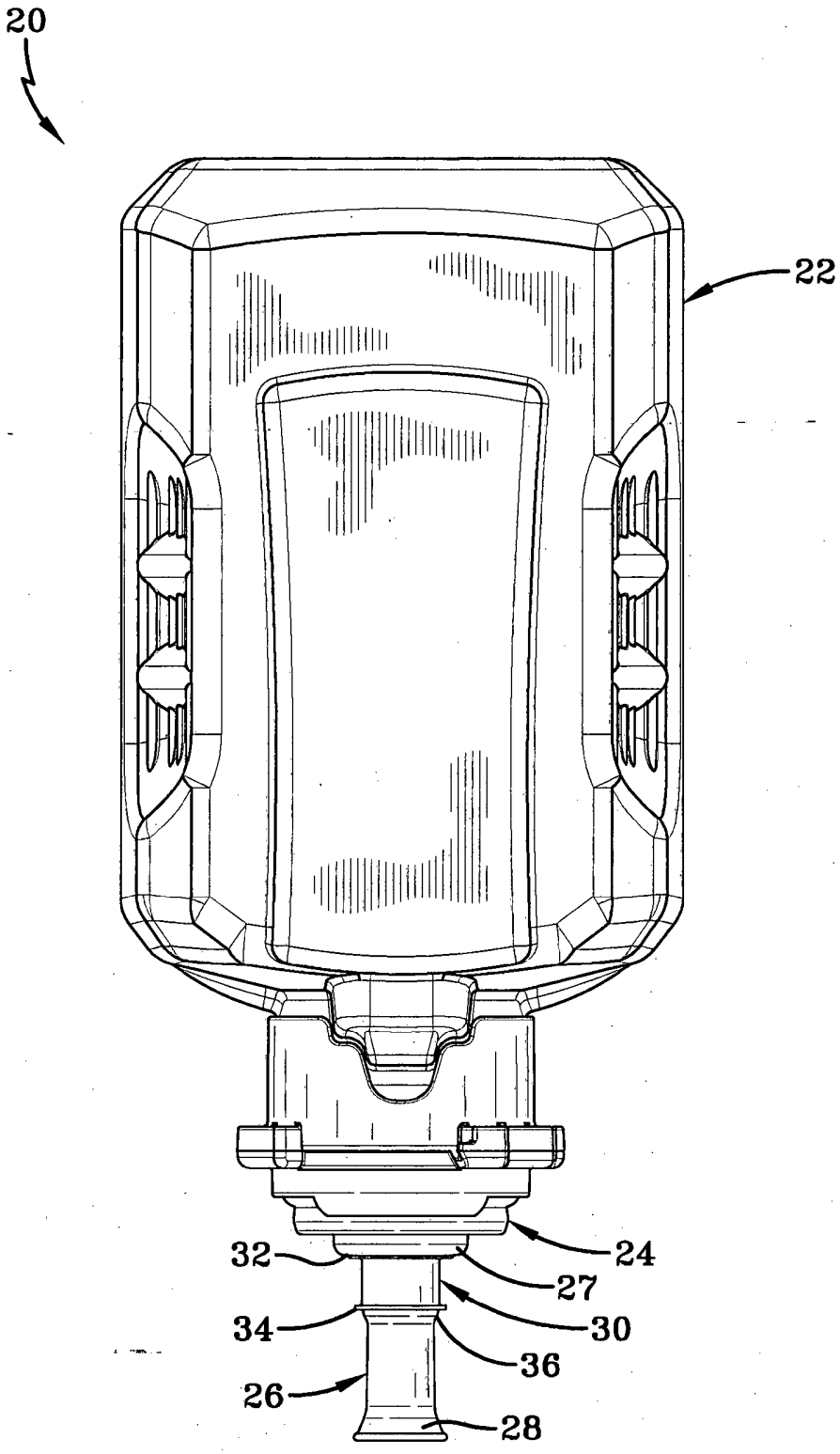
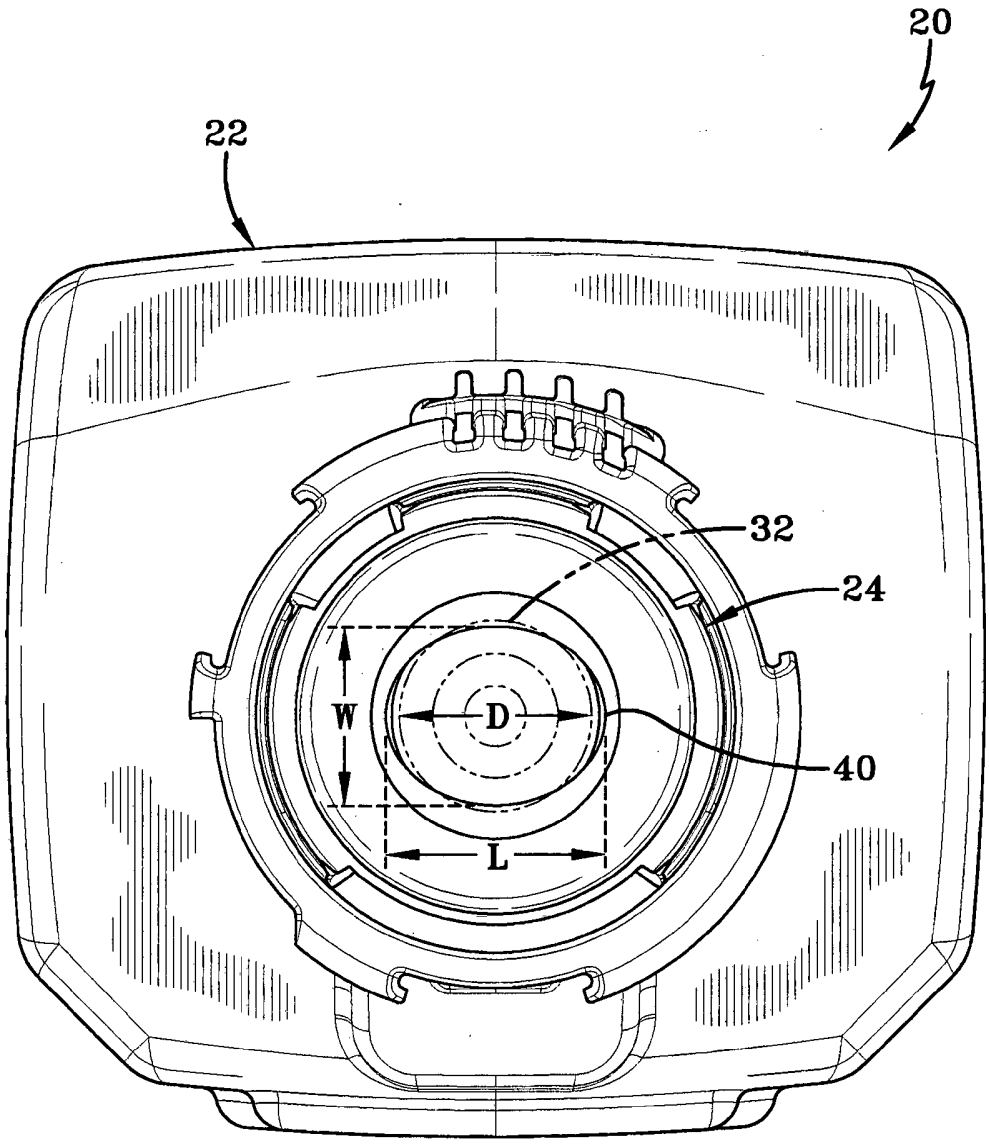


FIG-3



FIG−4

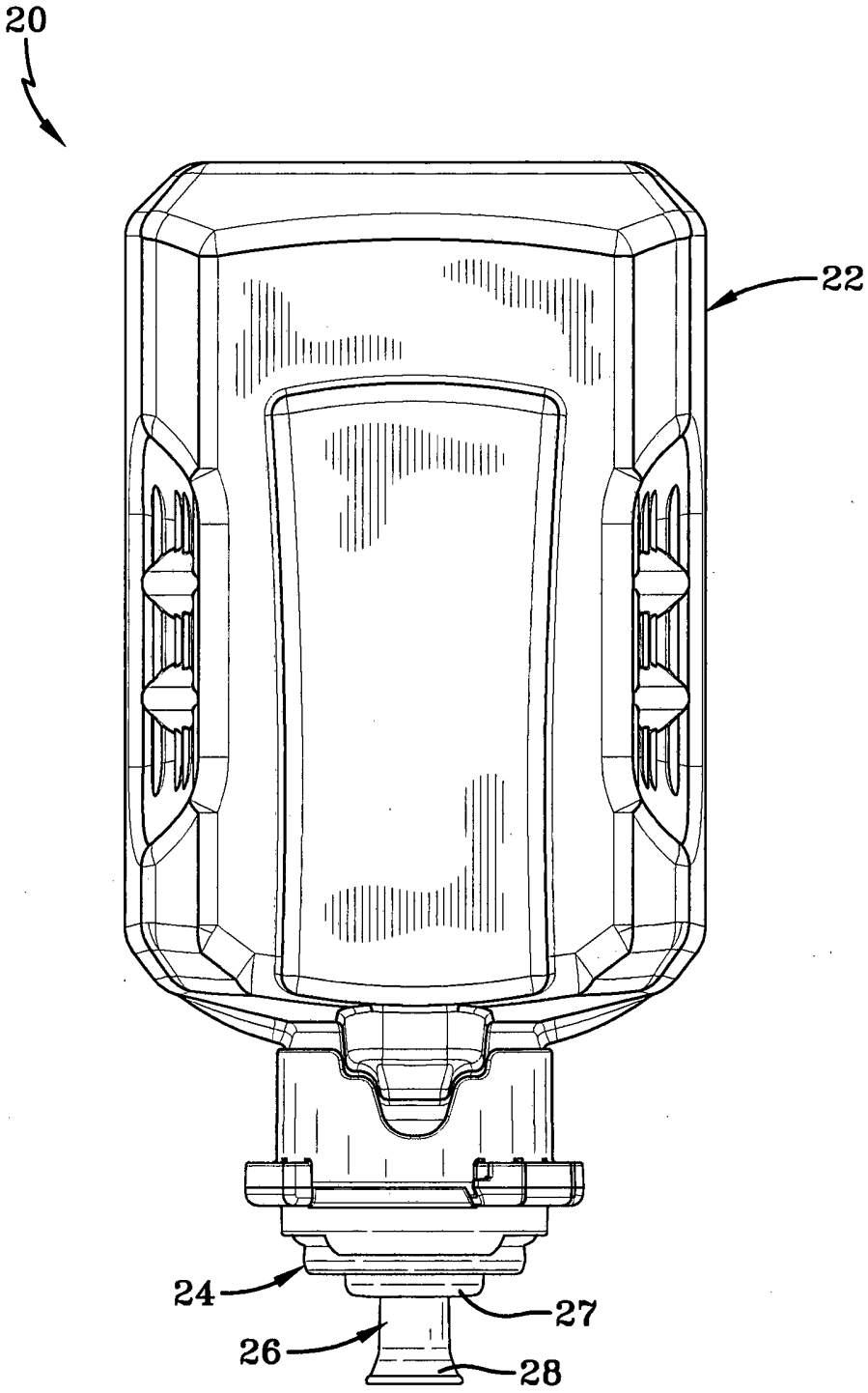


FIG-4A

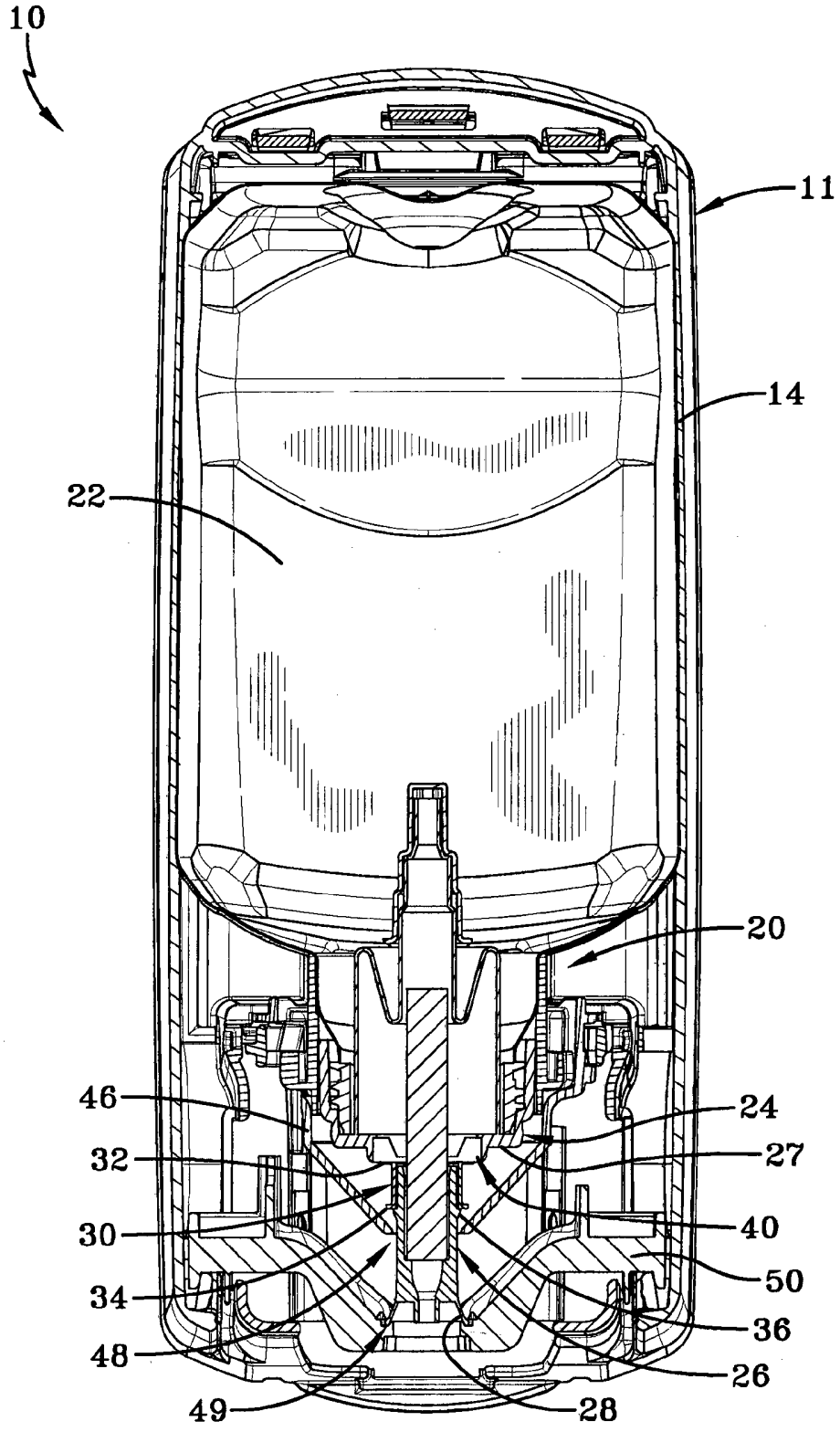


FIG-5

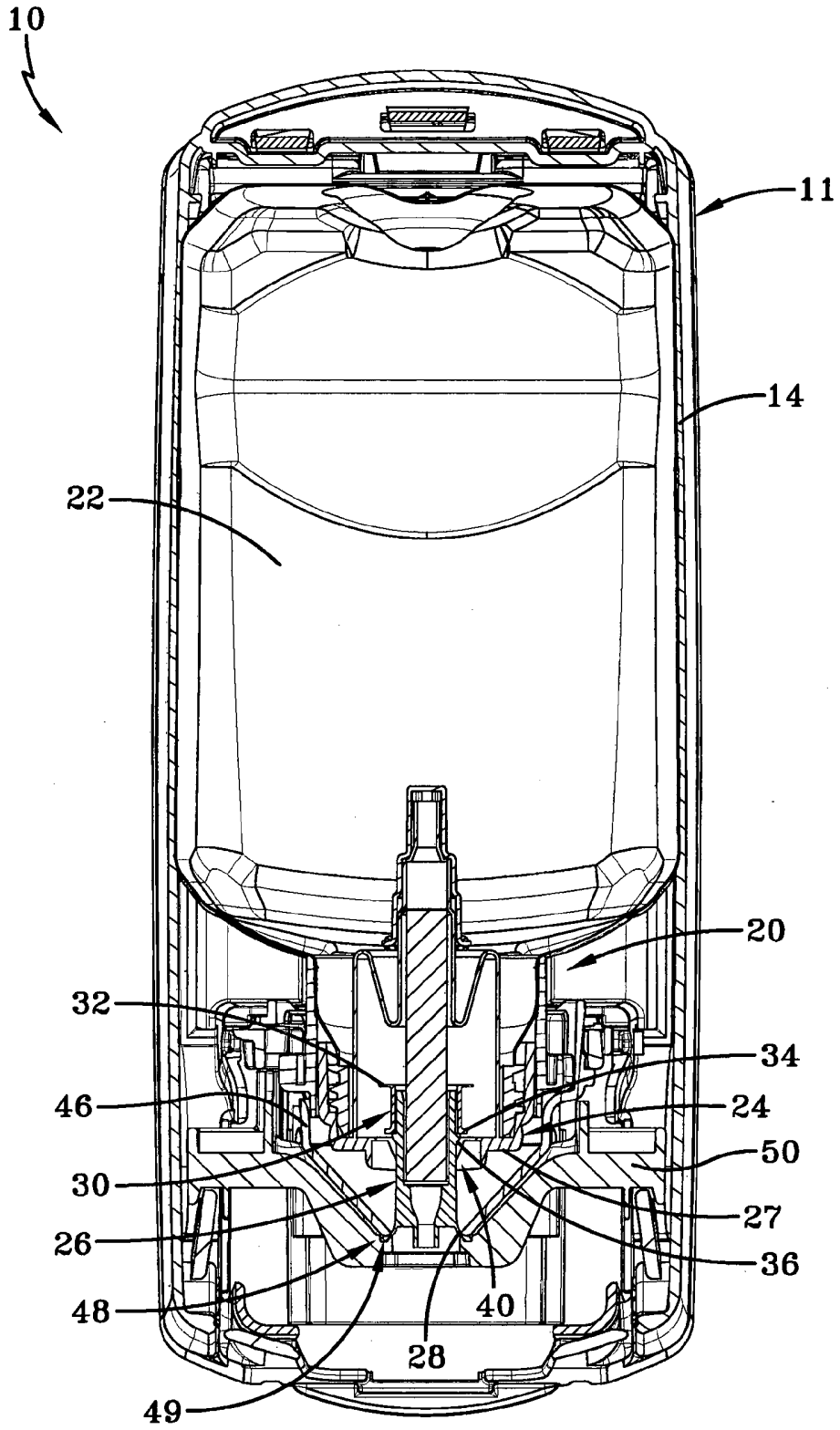


FIG-6

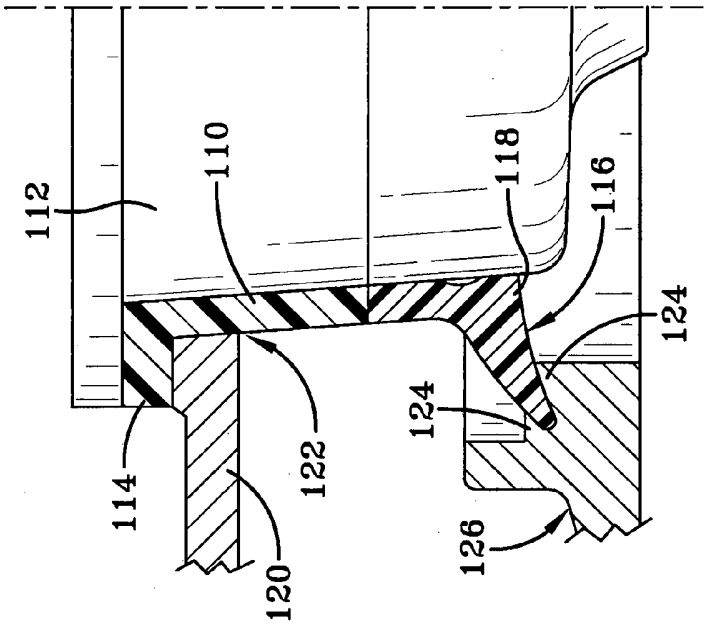

112
110
118
116
124
124
114
122
126
120

FIG-8

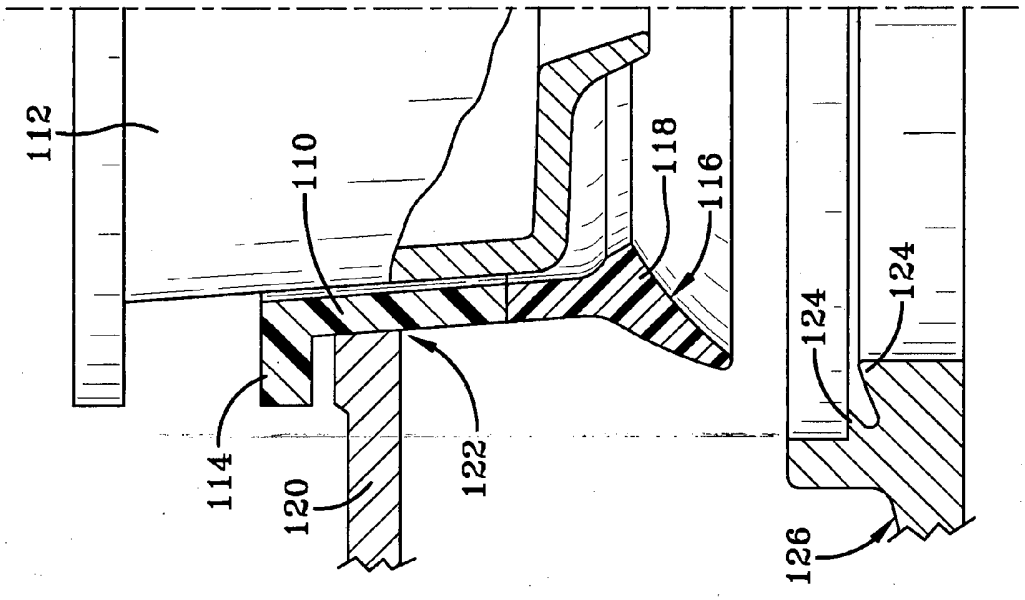

112
110
118
116
124
124
114
120
122
126

FIG-7

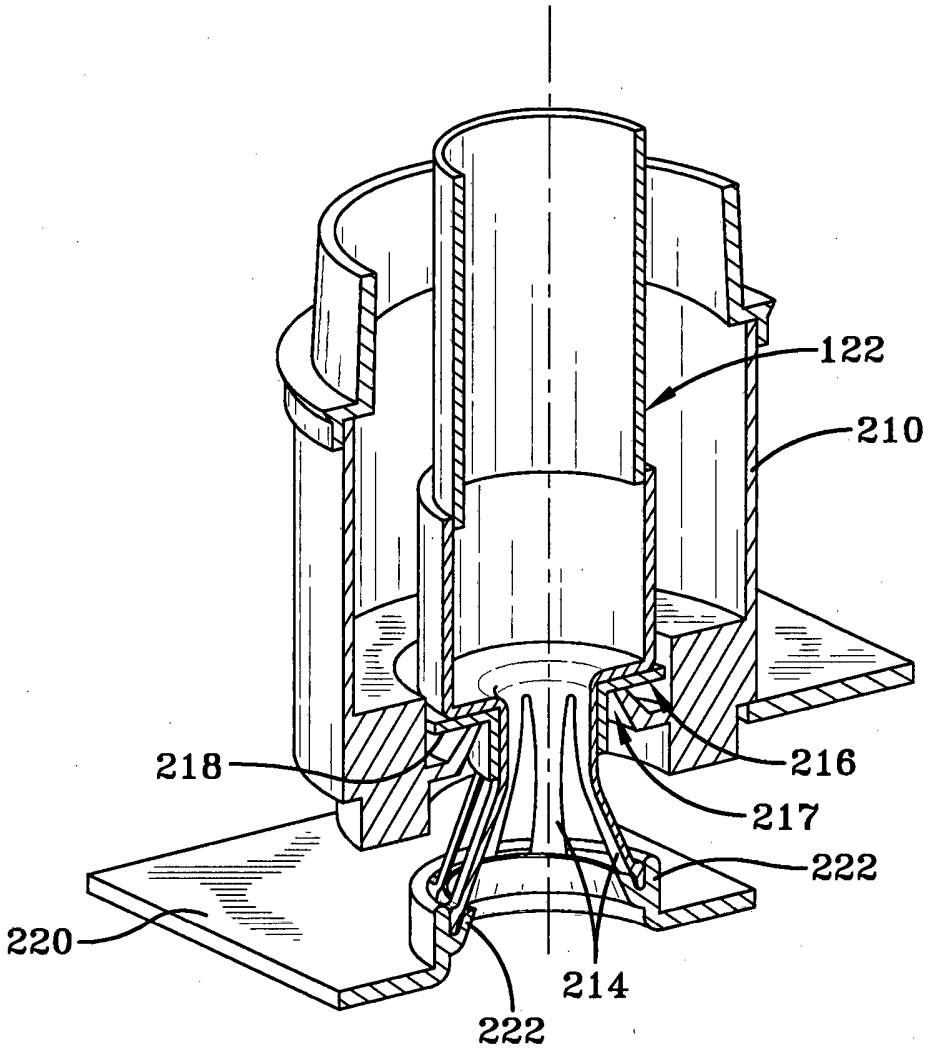


FIG-9